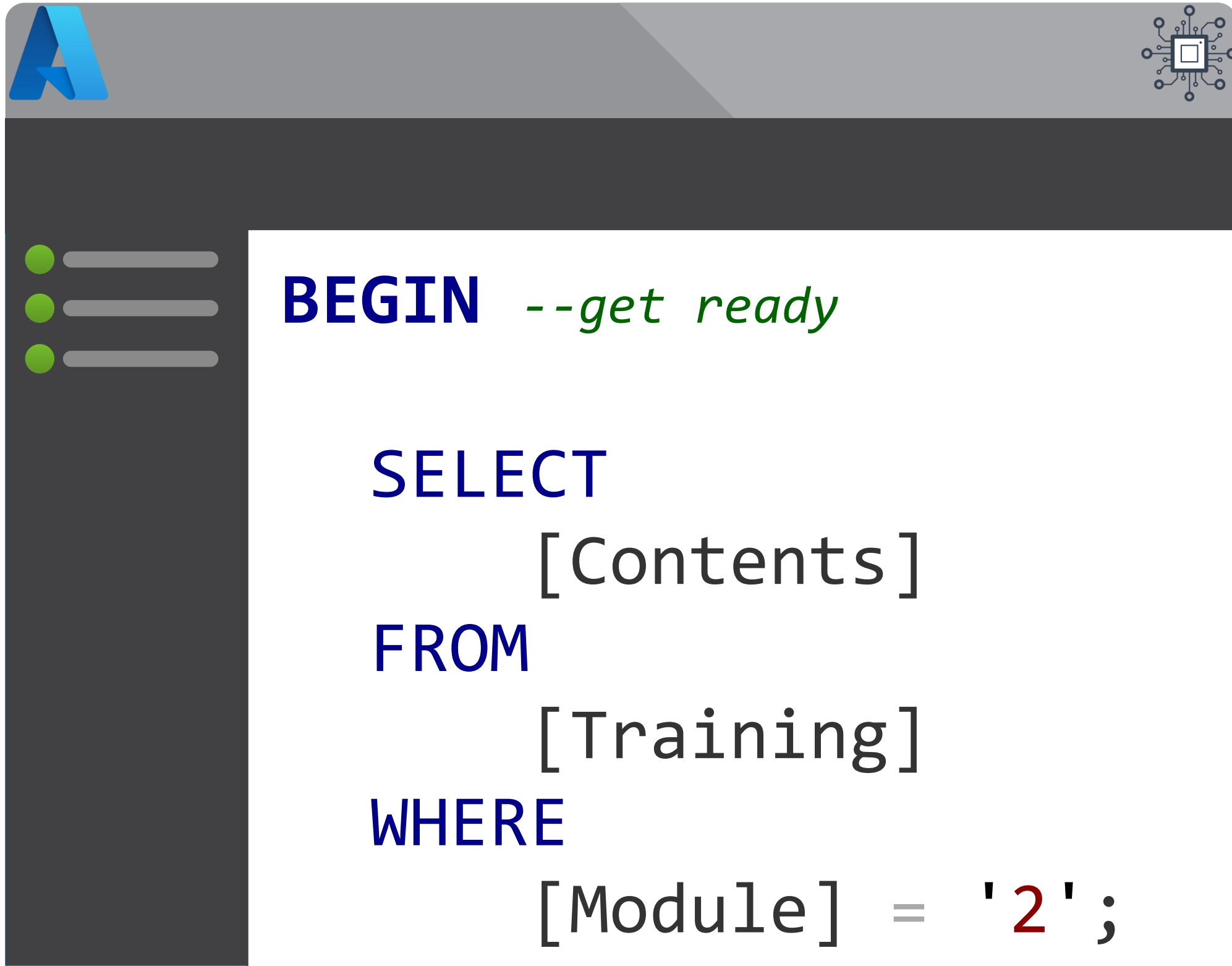


Module 2

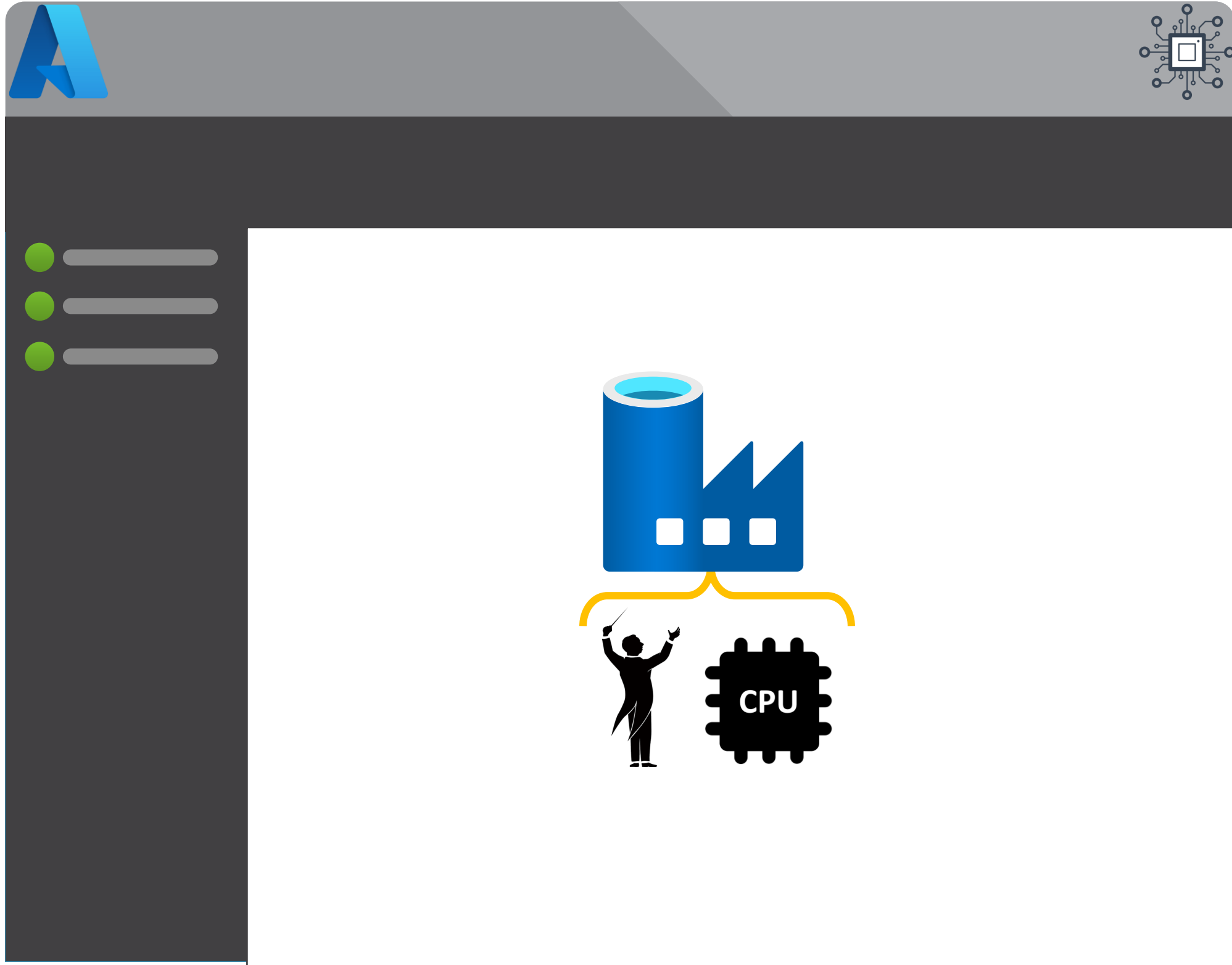
Integration Runtime Design Patterns



- Compute Types
 - Azure
 - Hosted
 - SSIS
- Patterns & Configuration

Module 2

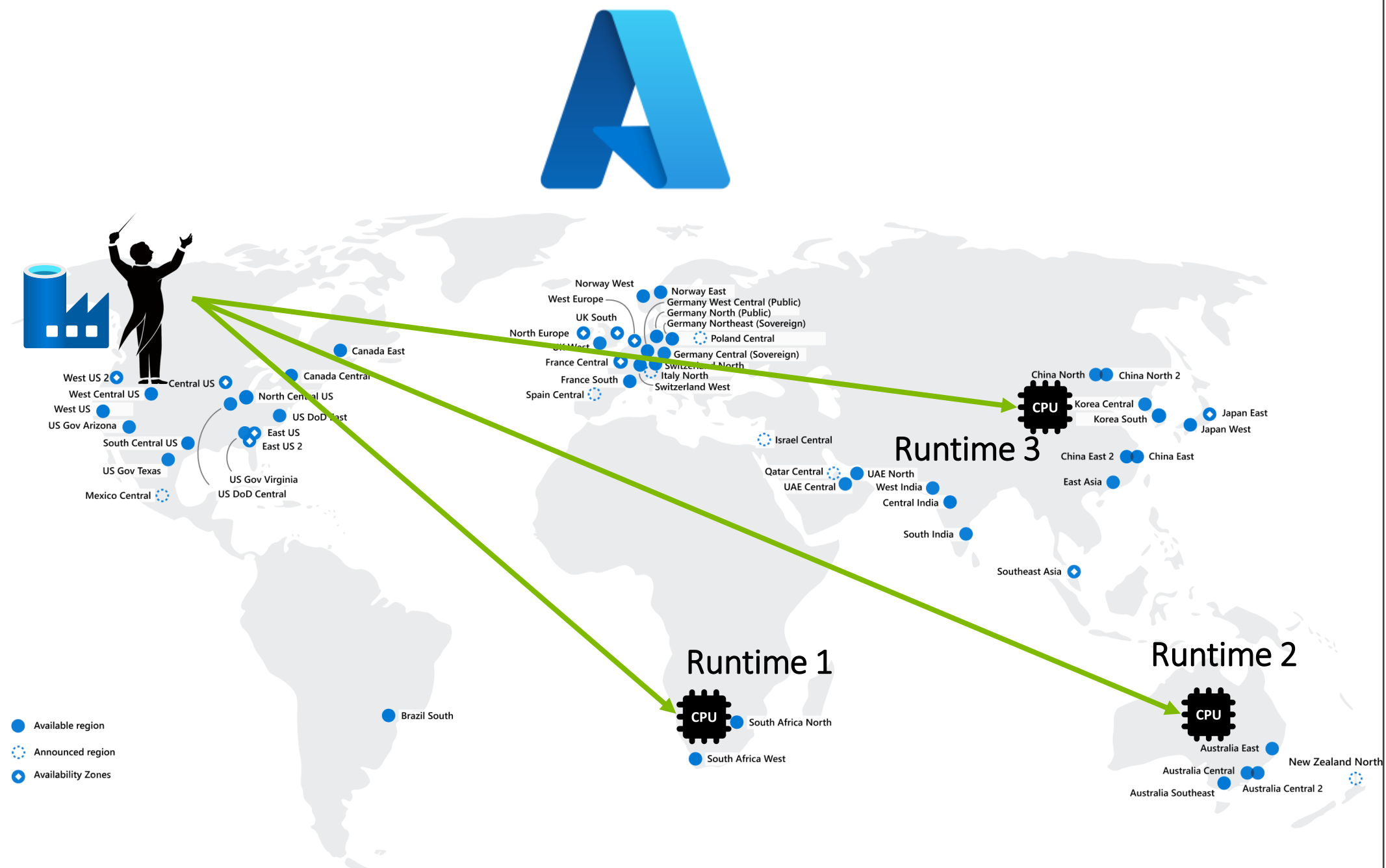
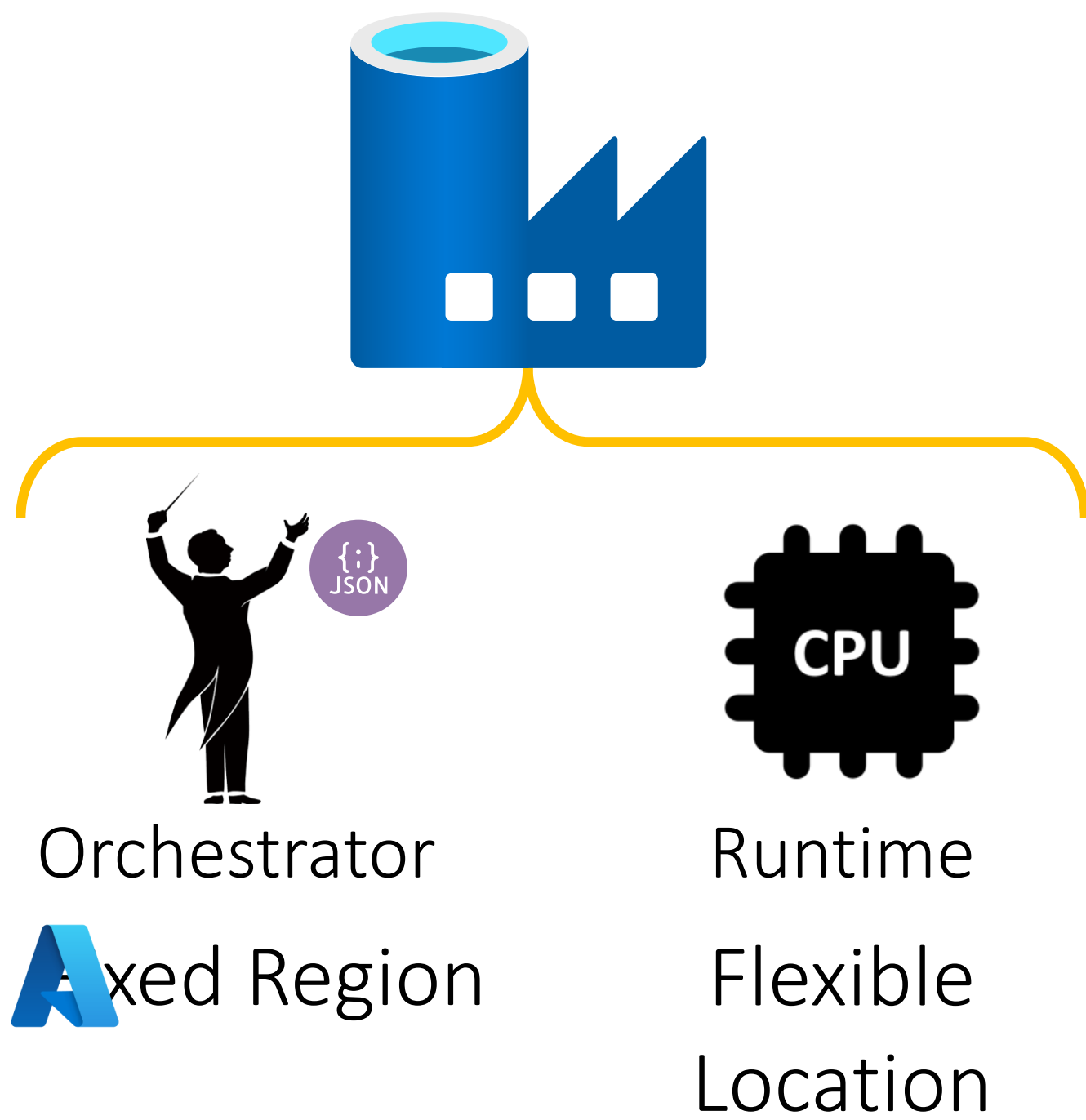
Integration Runtime Design Patterns



- Compute Types
 - Azure
 - Hosted
 - SSIS
- Patterns & Configuration

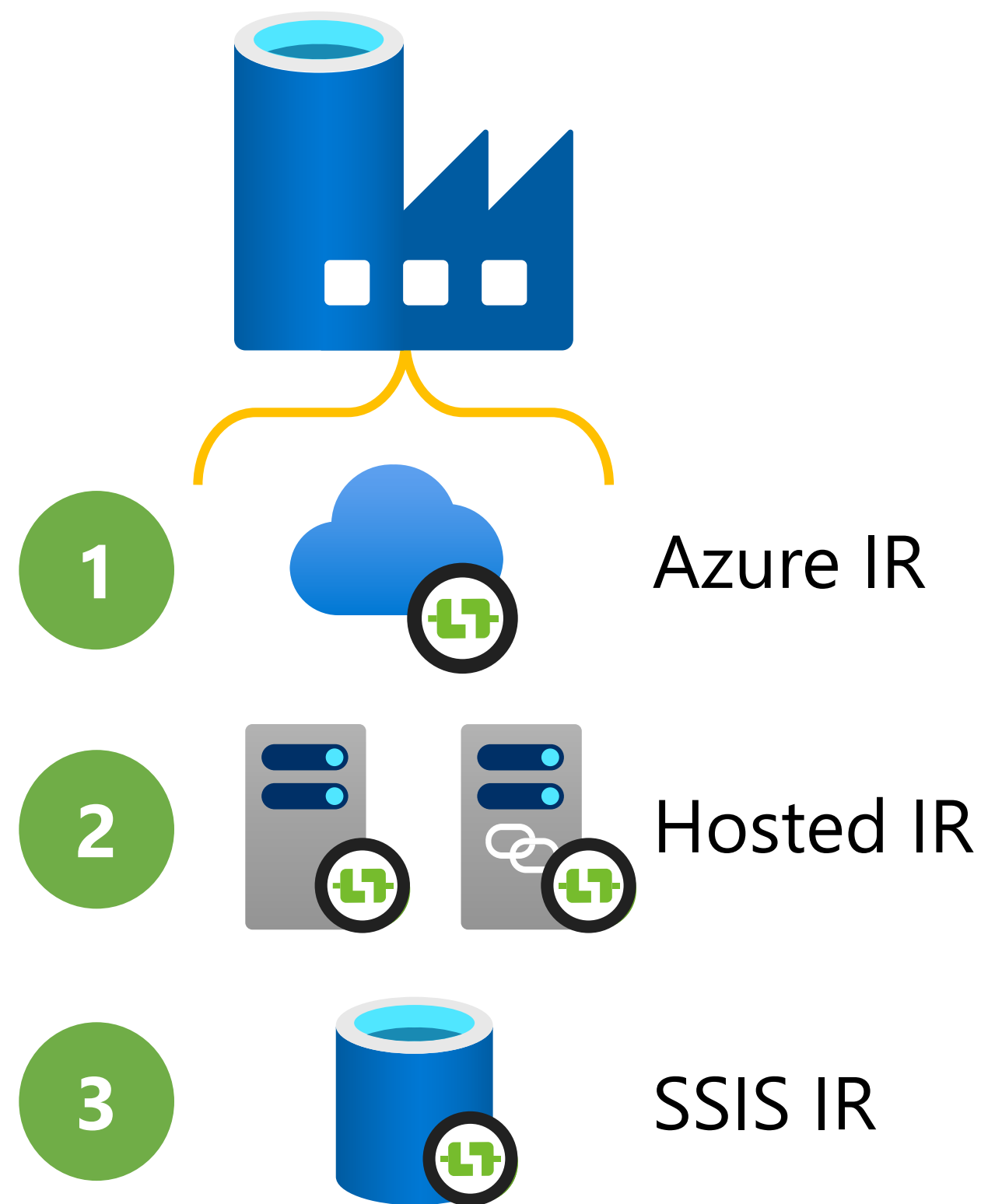
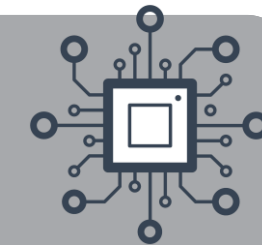


What is an Integration Runtime?



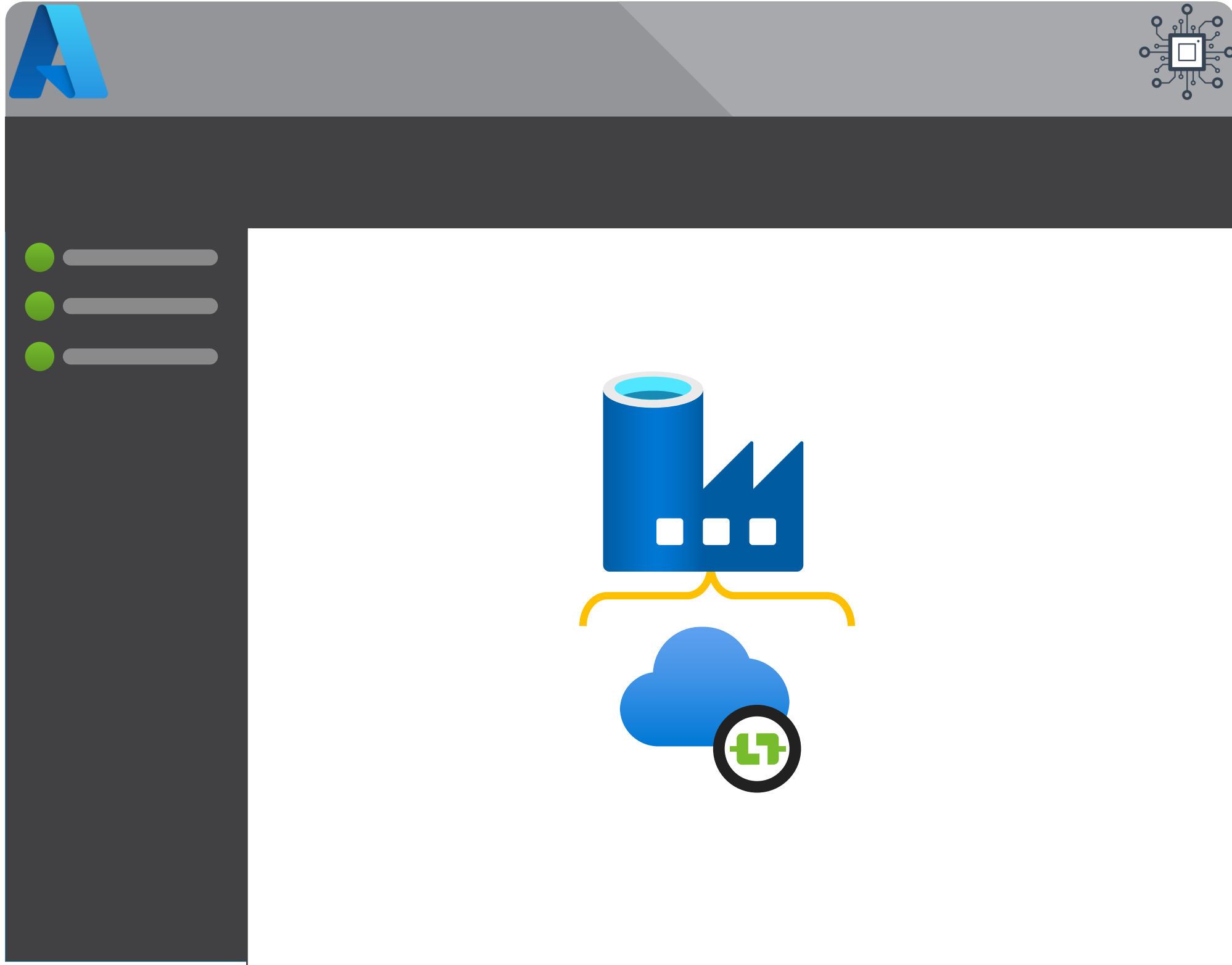


What can an Integration Runtime do?



Module 2

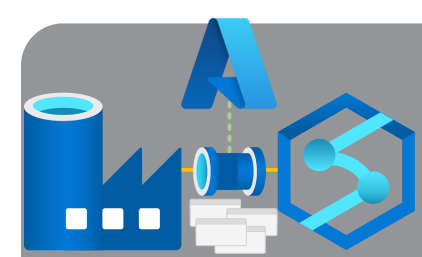
Integration Runtime Design Patterns



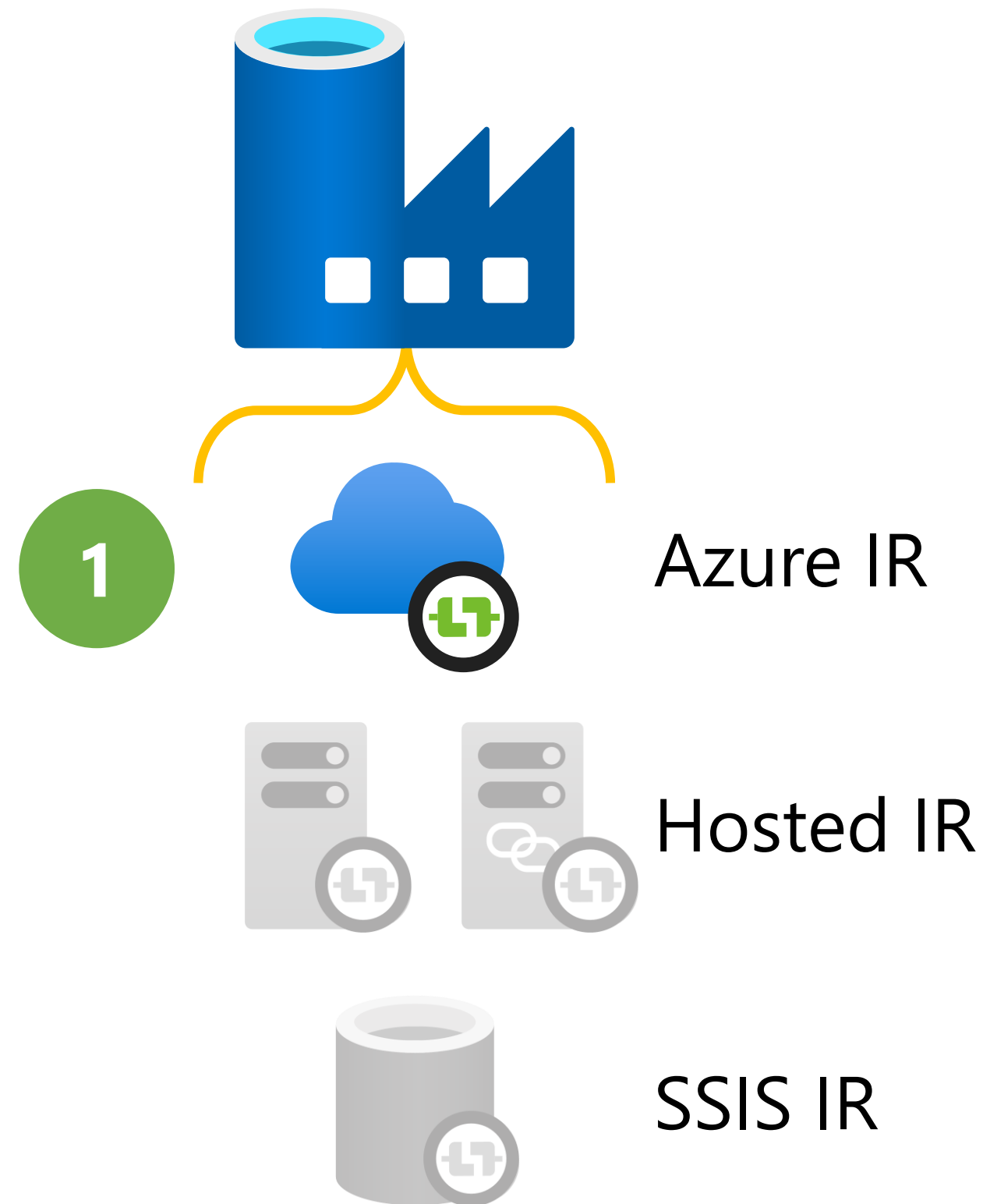
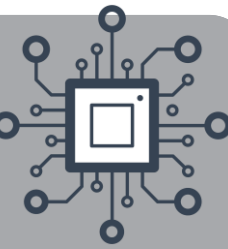
- Compute Types

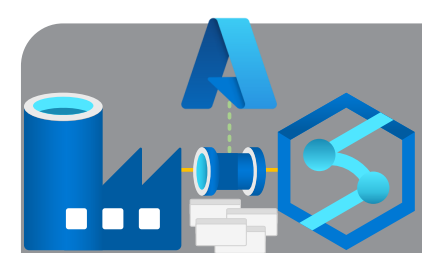
- Azure
- Hosted
- SSIS

- Patterns & Configuration

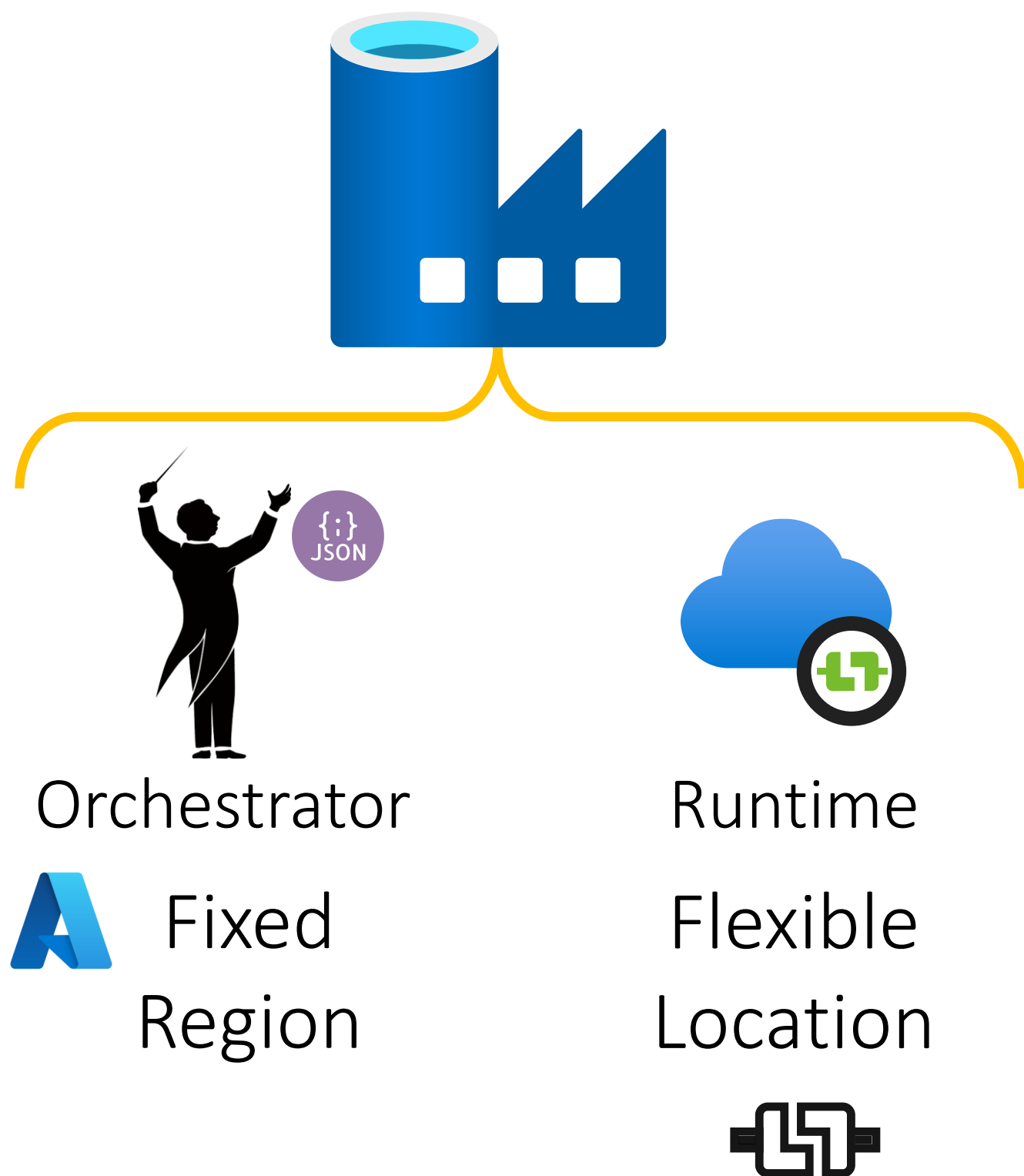
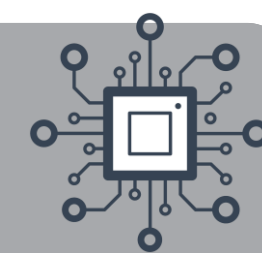


What can an Integration Runtime do?





What is an Integration Runtime?



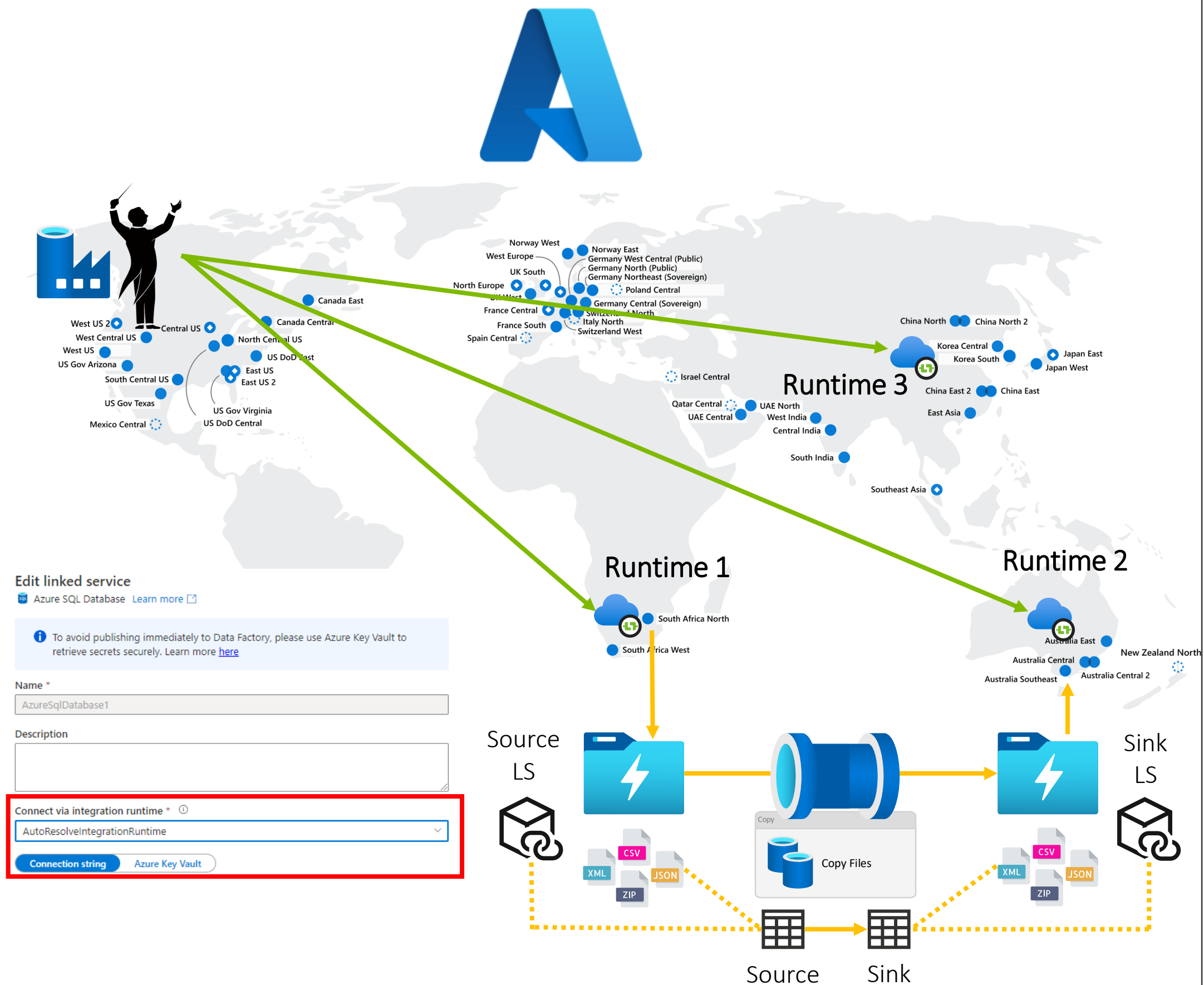
Orchestrator

A Fixed
Region

Runtime
Flexible
Location



AutoResolveIntegrationRuntime



Edit linked service

Azure SQL Database [Learn more](#)

To avoid publishing immediately to Data Factory, please use Azure Key Vault to retrieve secrets securely. [Learn more](#)

Name *

AzureSqlDatabase1

Description

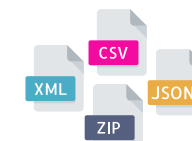
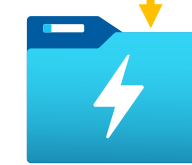
Connect via integration runtime *

AutoResolveIntegrationRuntime

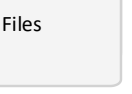
Connection string

Azure Key Vault

Source
LS



Source



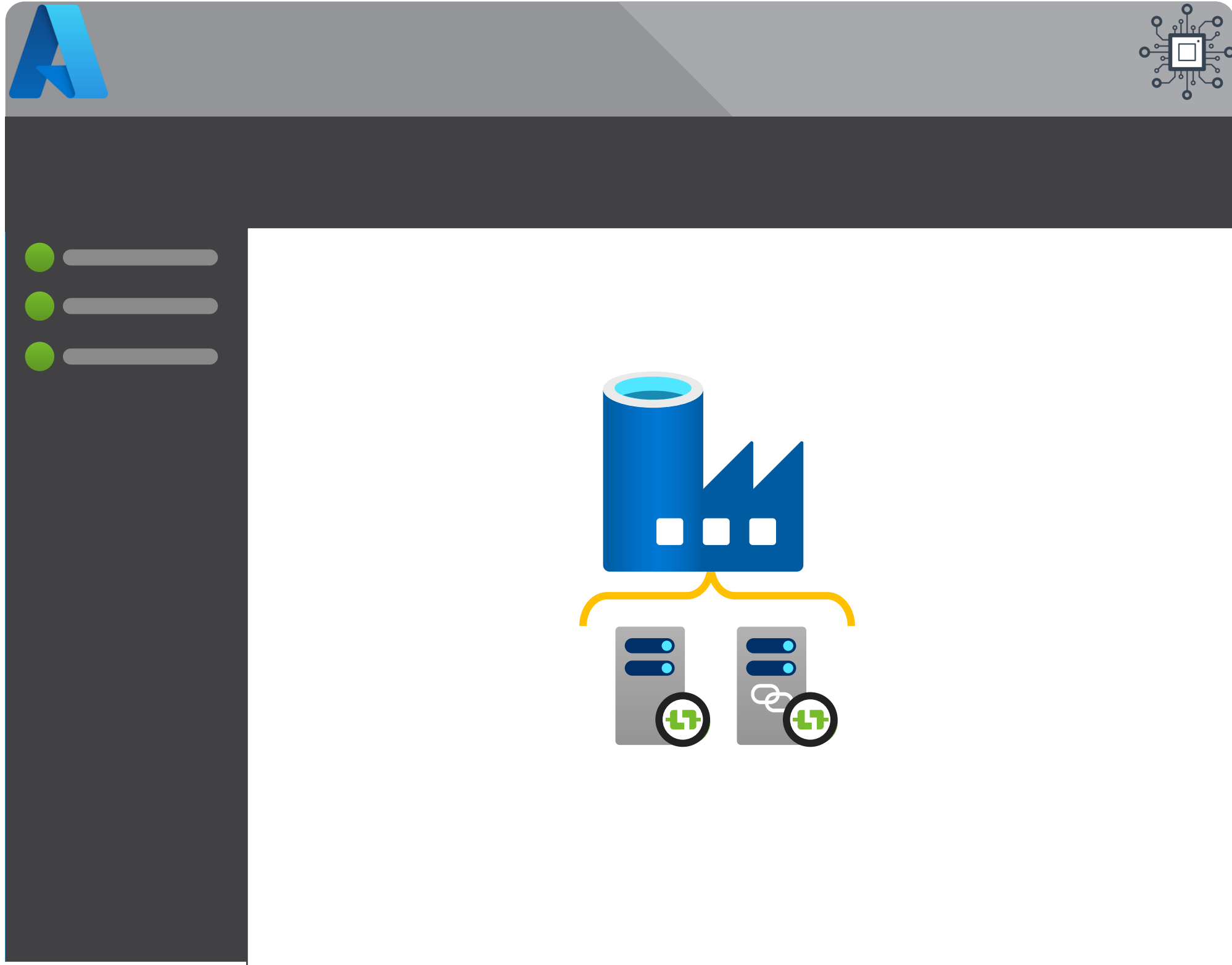
Sink

Sink
LS



Module 2

Integration Runtime Design Patterns



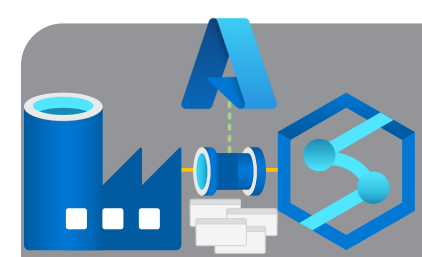
- Compute Types

- Azure

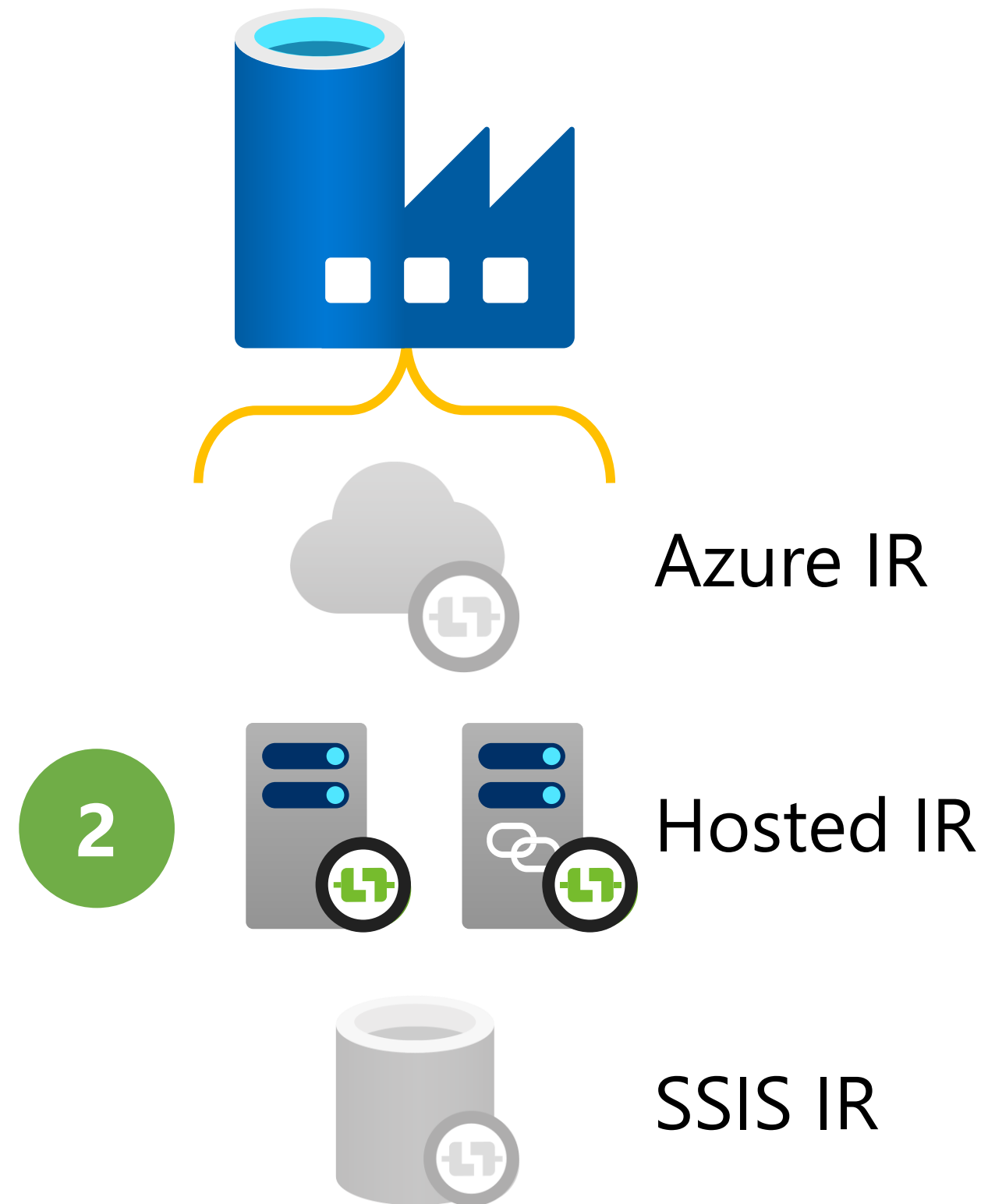
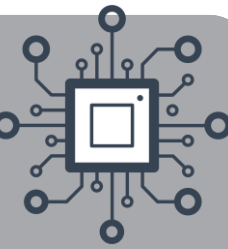
- Hosted

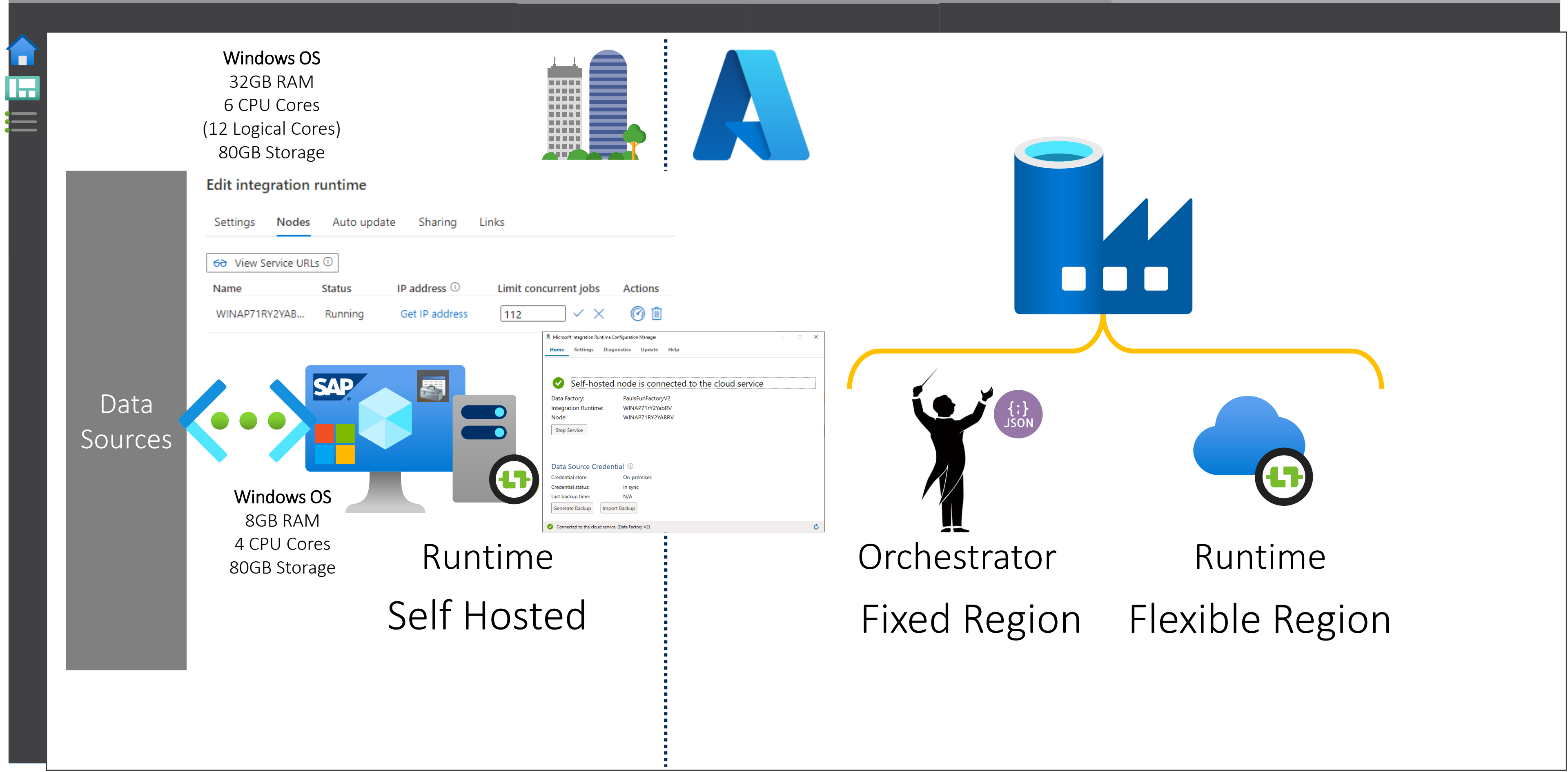
- SSIS

- Patterns & Configuration



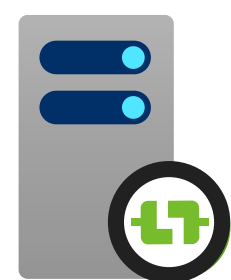
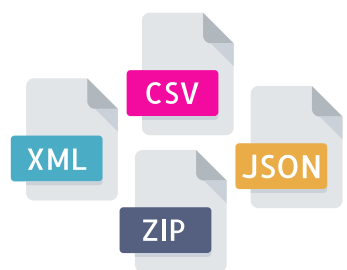
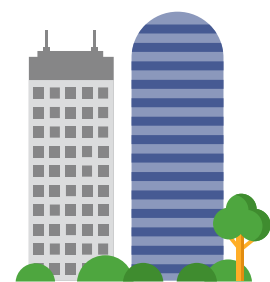
What can an Integration Runtime do?



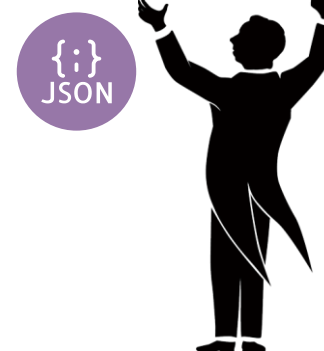
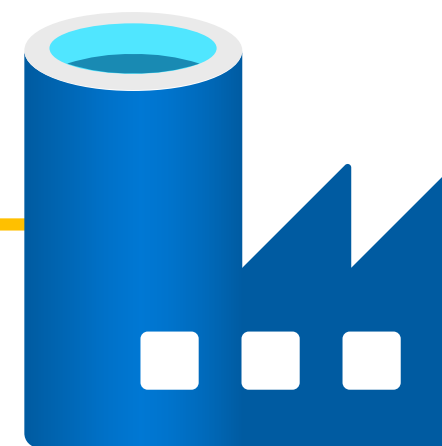




Hosted Integration Runtime



Runtime
Self Hosted



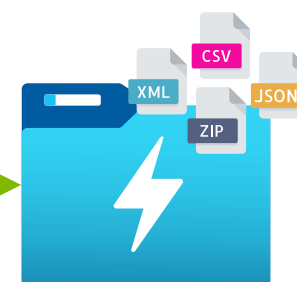
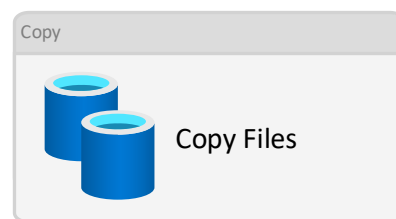
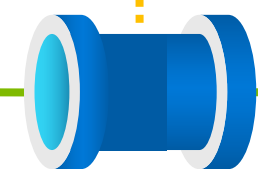
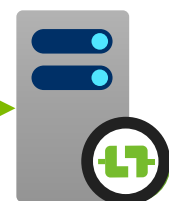
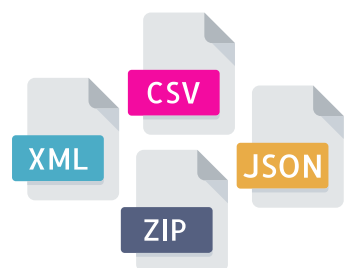
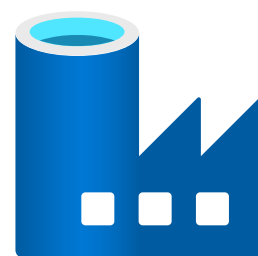
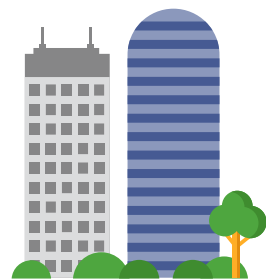
Orchestrator
Fixed Region

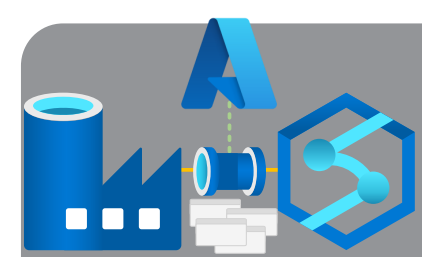


Runtime
Flexible Region

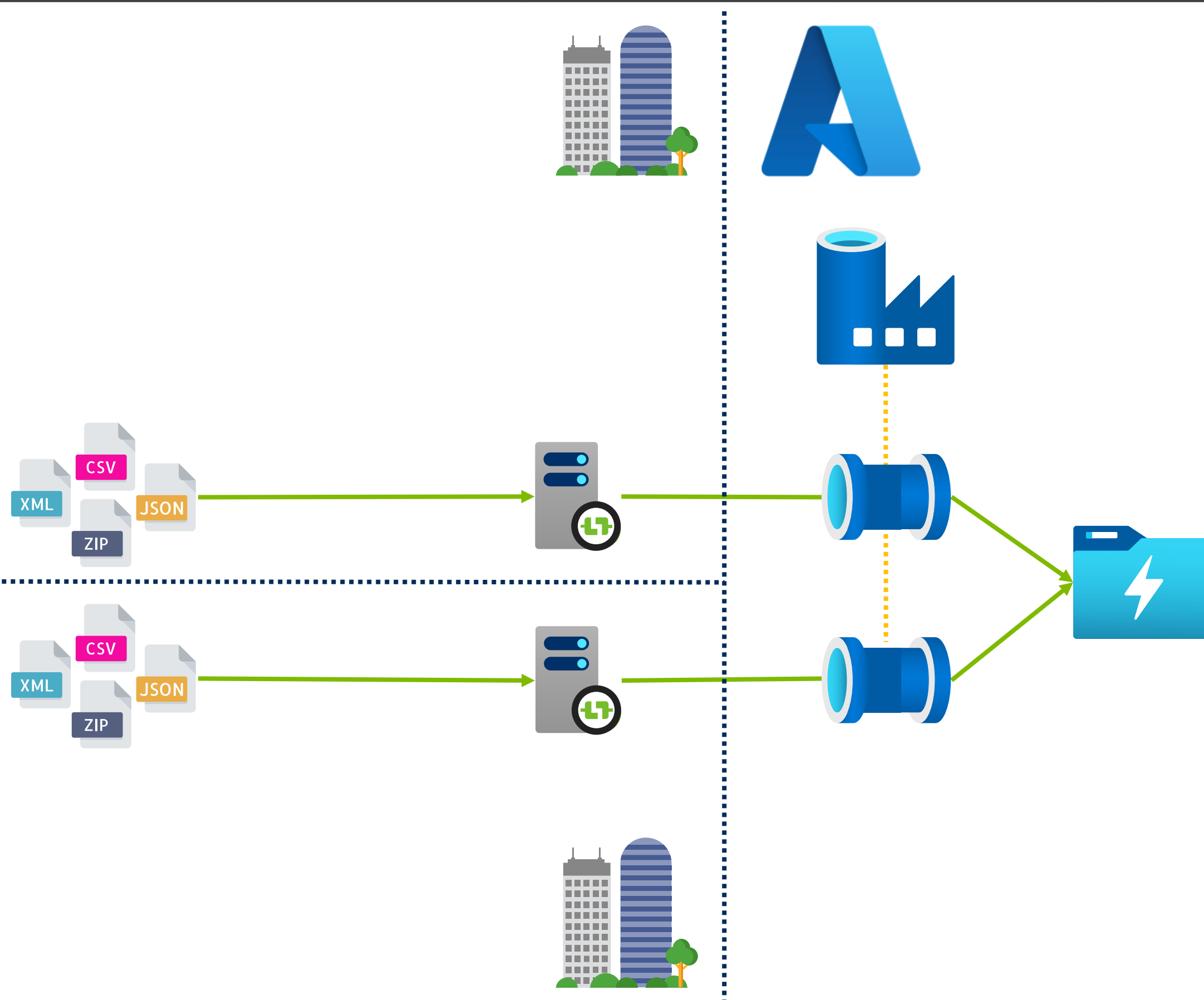
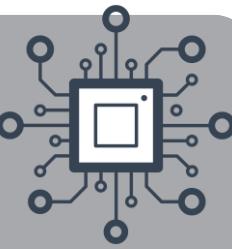


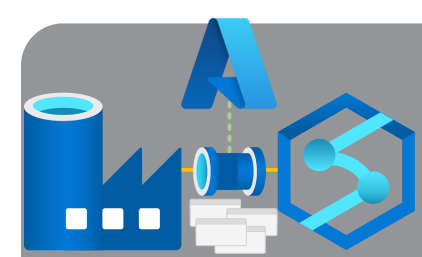
Single Hosted IR



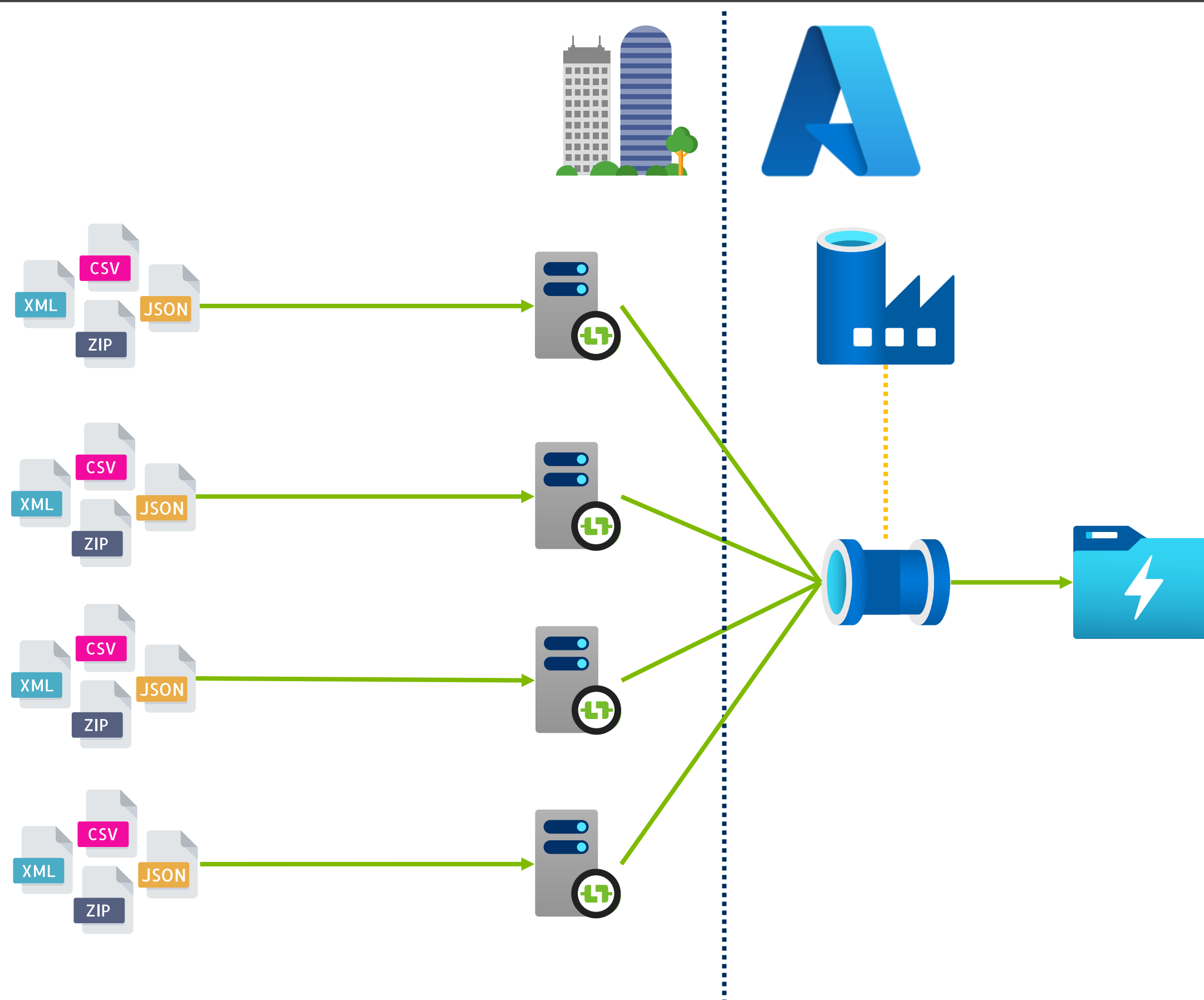
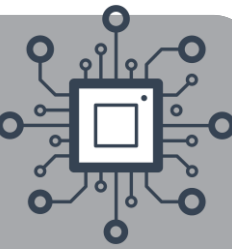


Multiple Hosted IR's at Different Sites

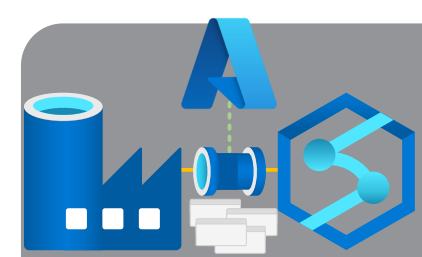




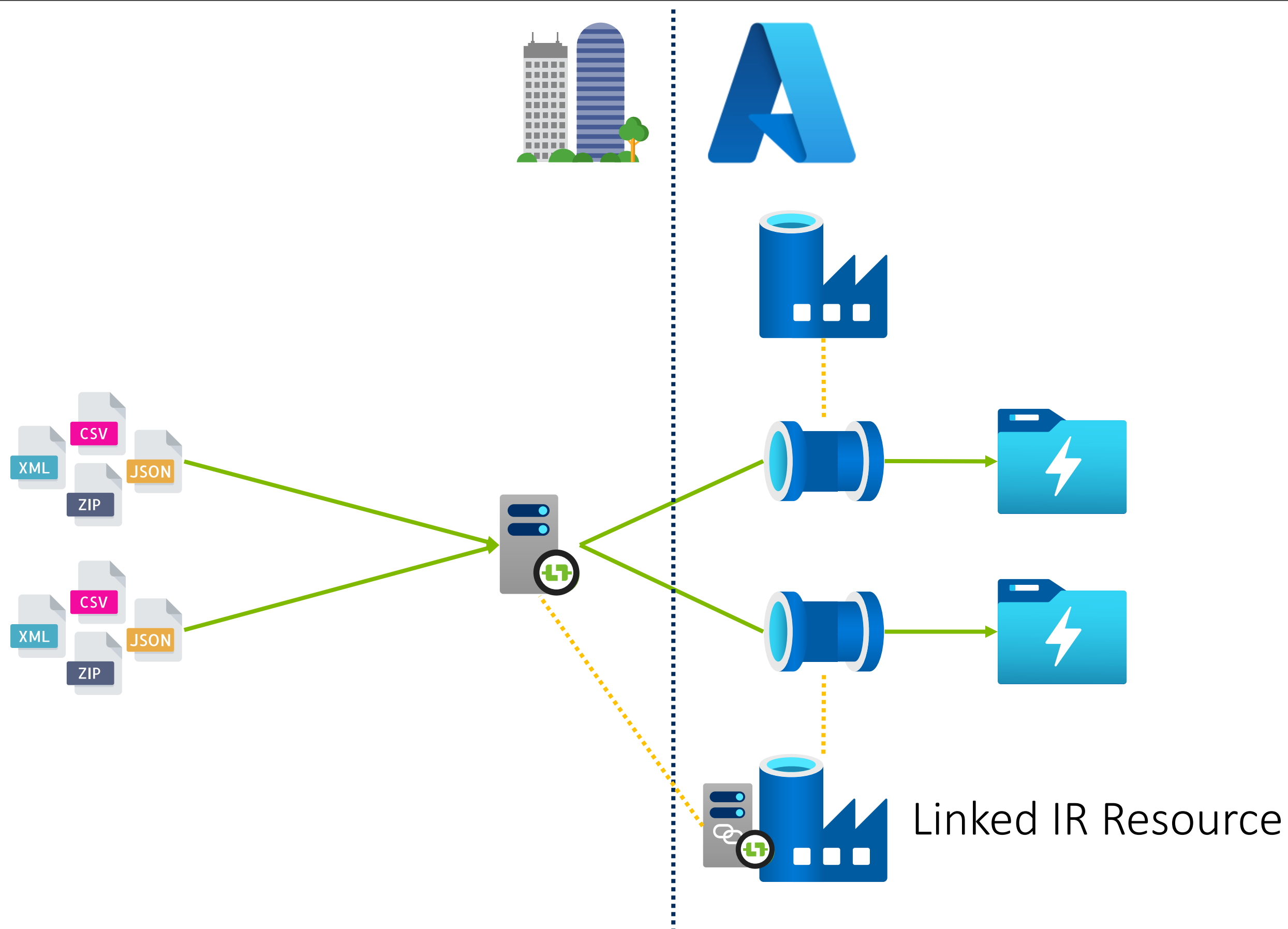
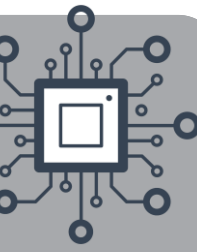
Multiple Hosted IR's as Separate Endpoints

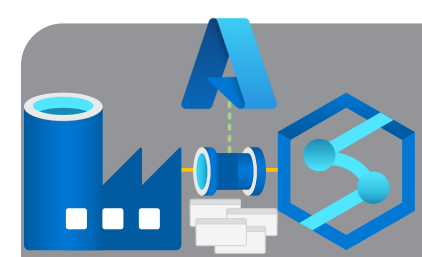




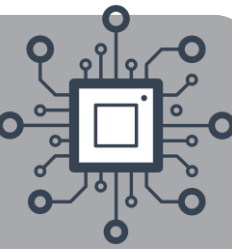


Single Hosted IR Linked to Multiple Data Factories



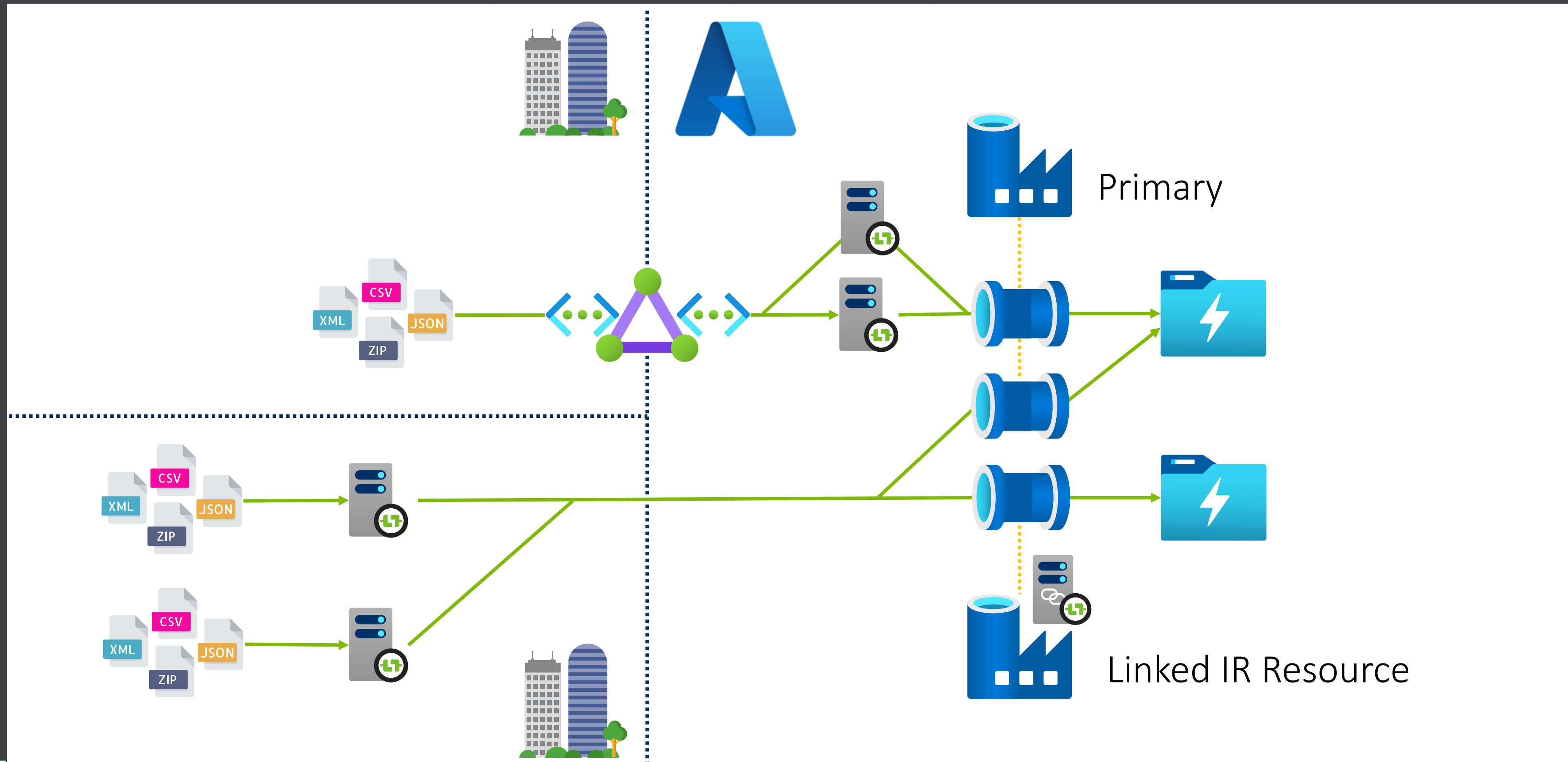


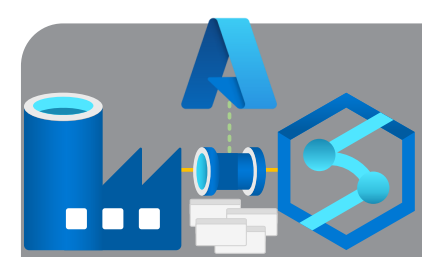
Hosted IR's with Express Route Connections



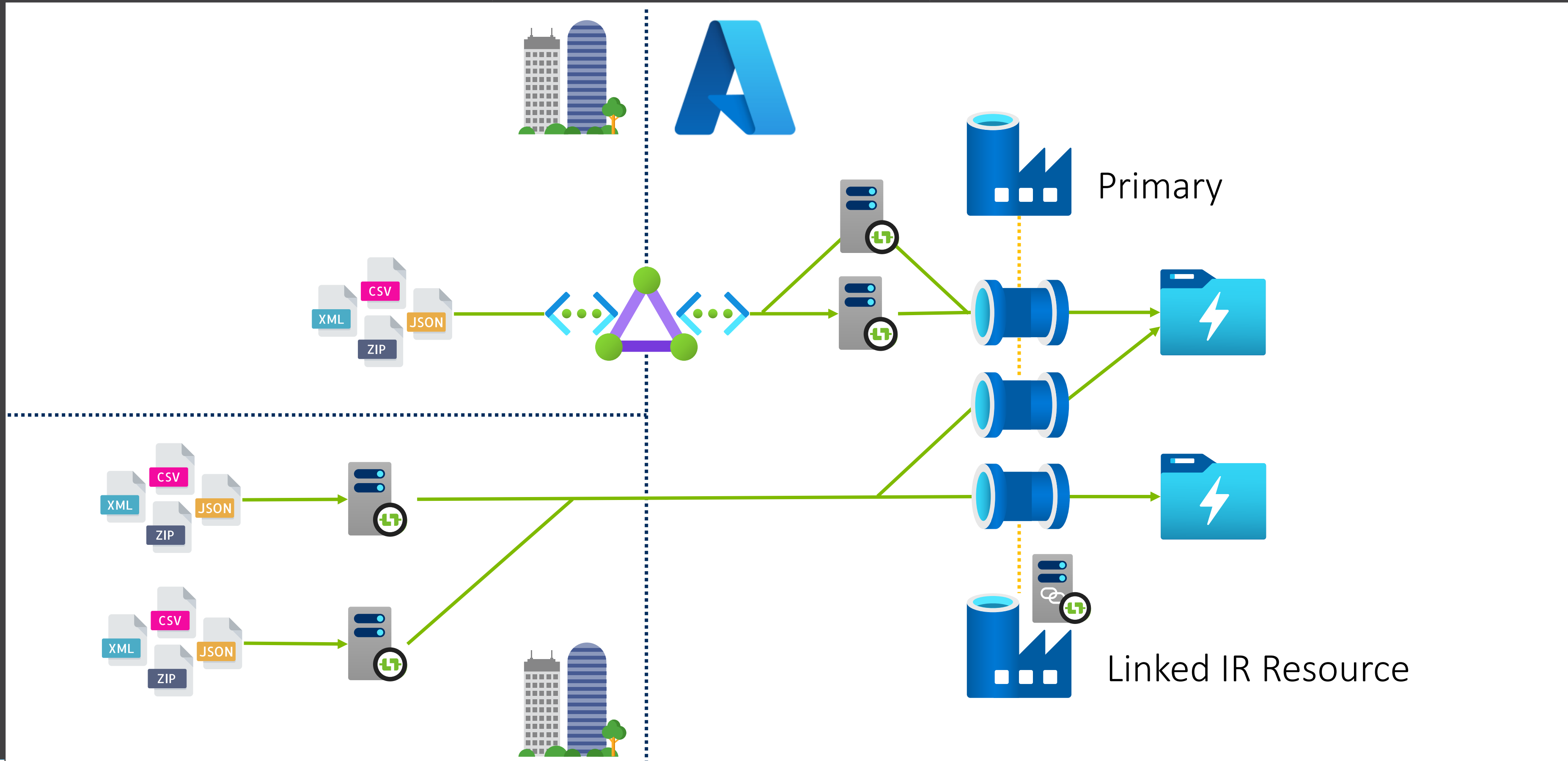
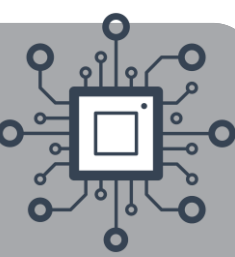


Hosted IR Combinations



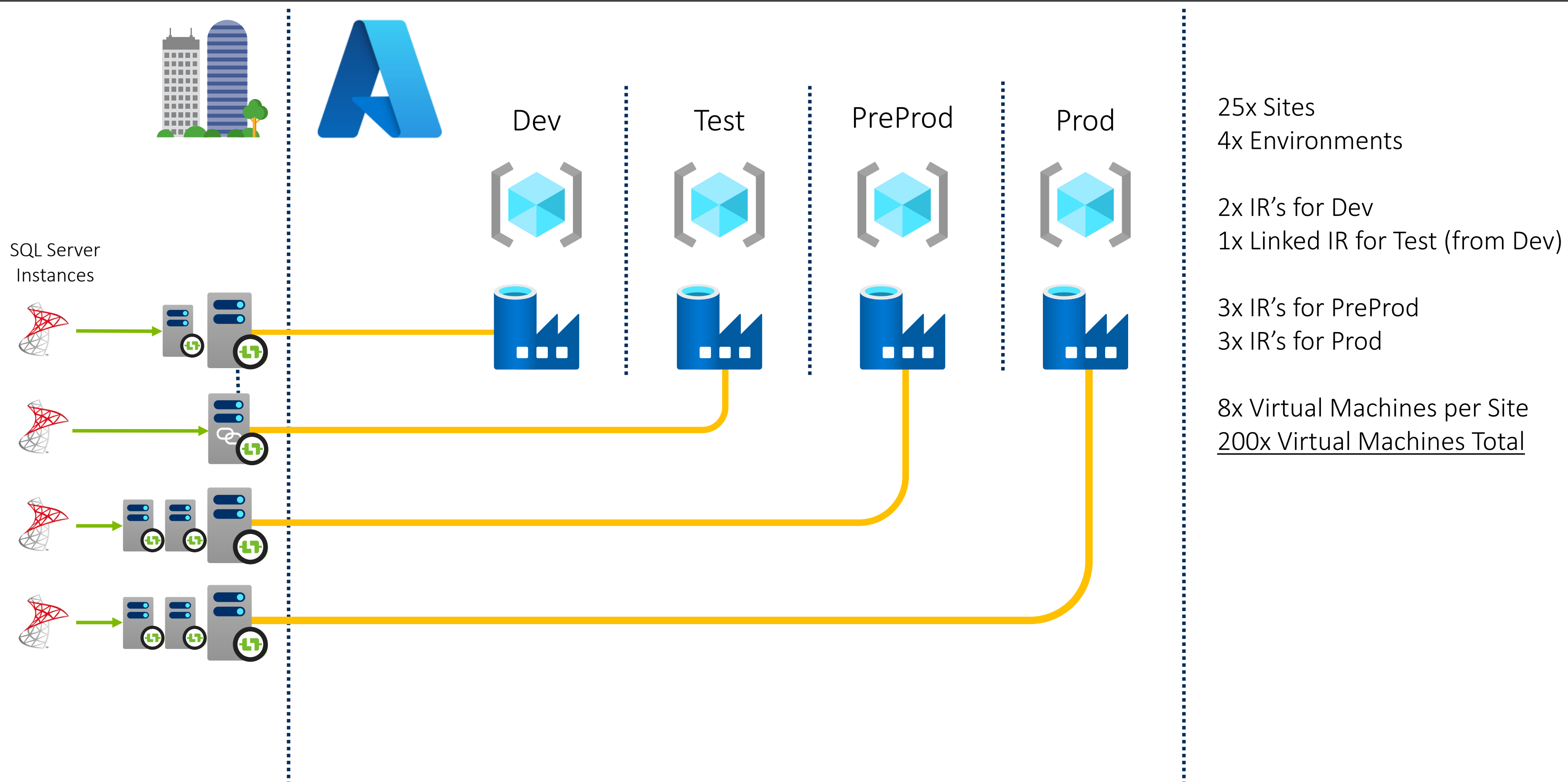


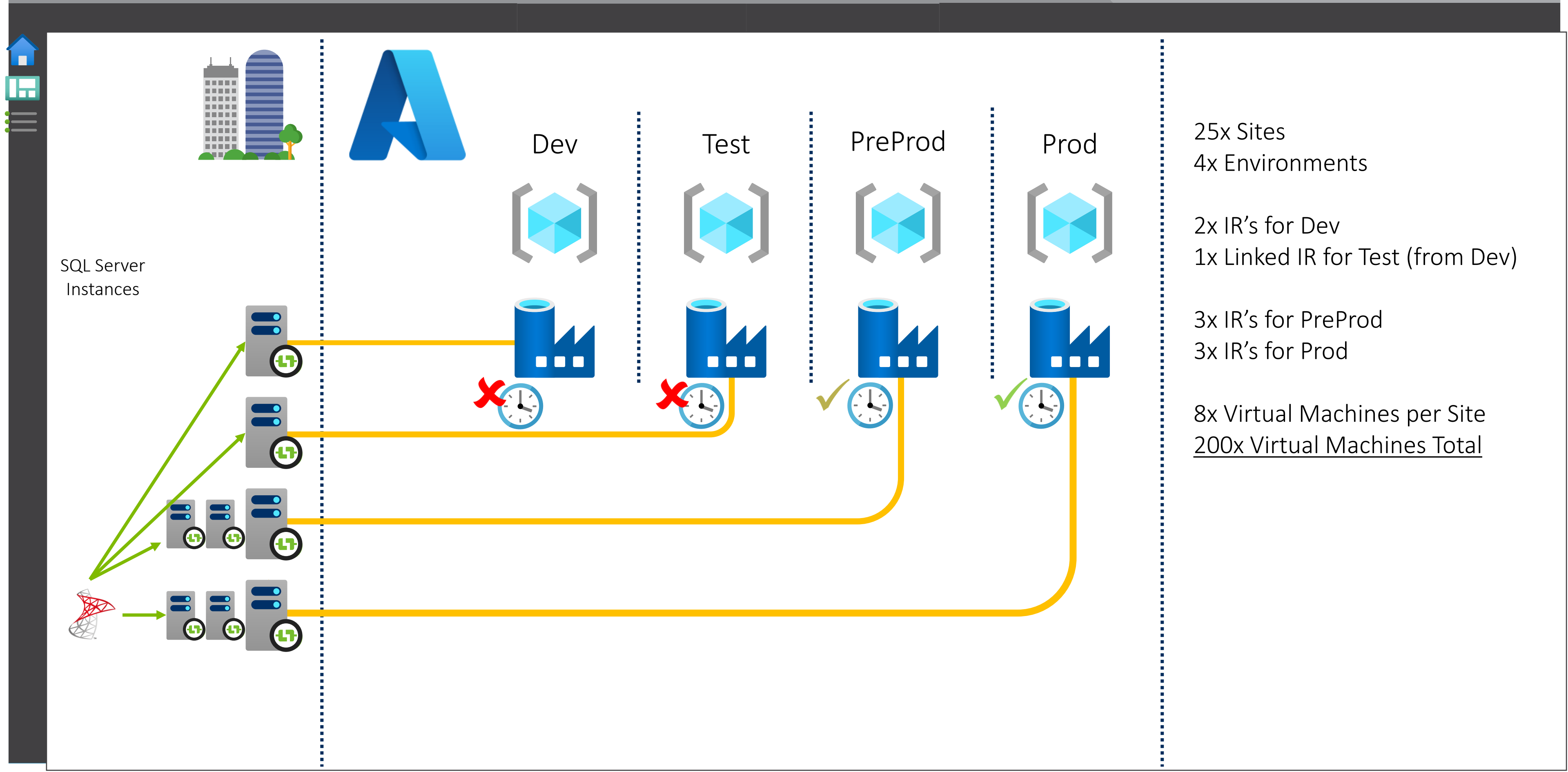
Horizontal vs Vertical Environment Processing





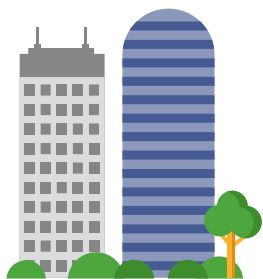
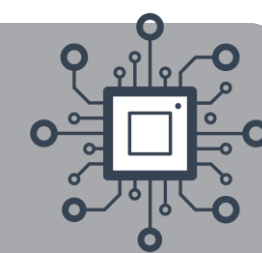
Hosted IR's vs Environments







Hosted IR's vs Environments

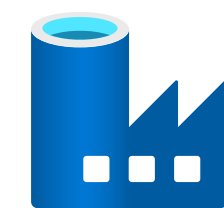
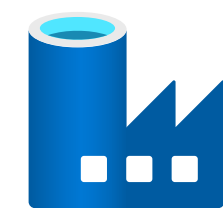
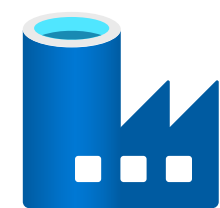
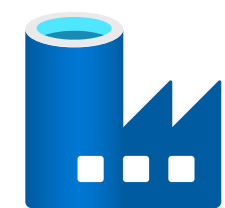
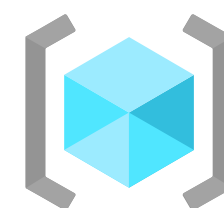
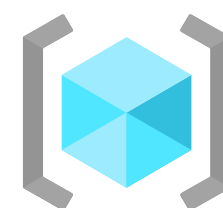
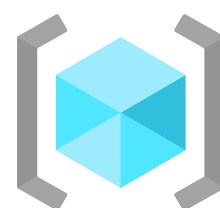
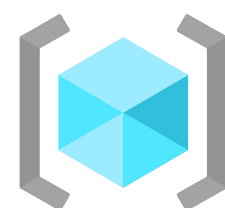


Dev

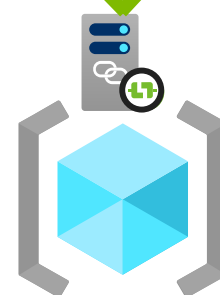
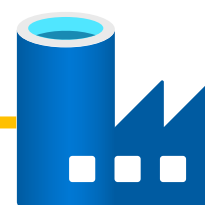
Test

PreProd

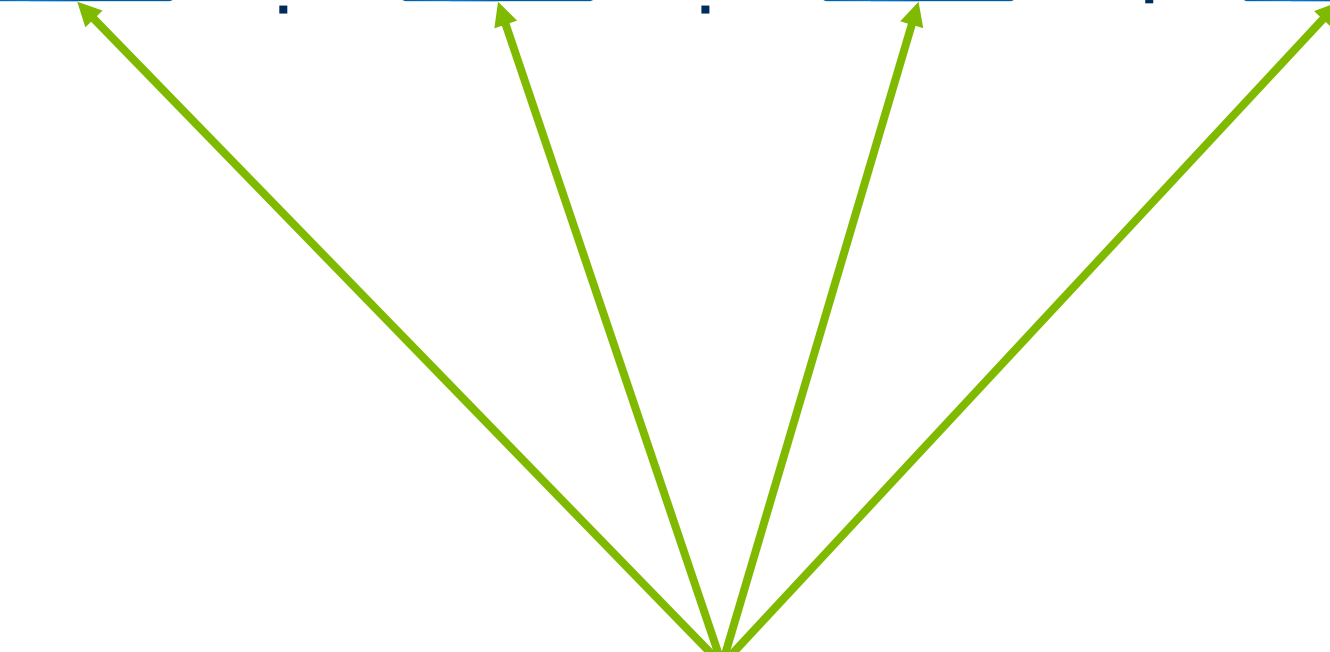
Prod



SQL Server
Instances

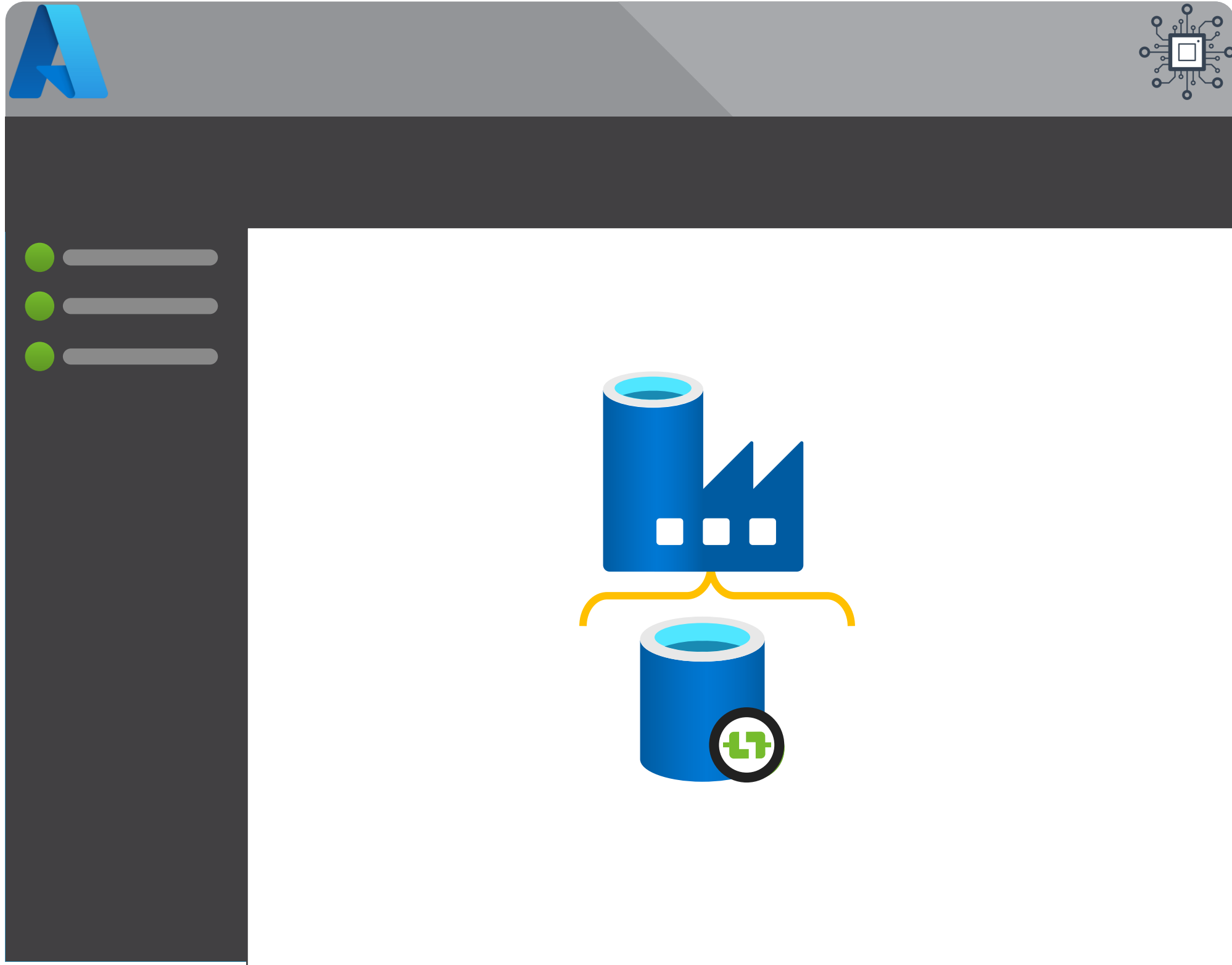


Common



Module 2

Integration Runtime Design Patterns



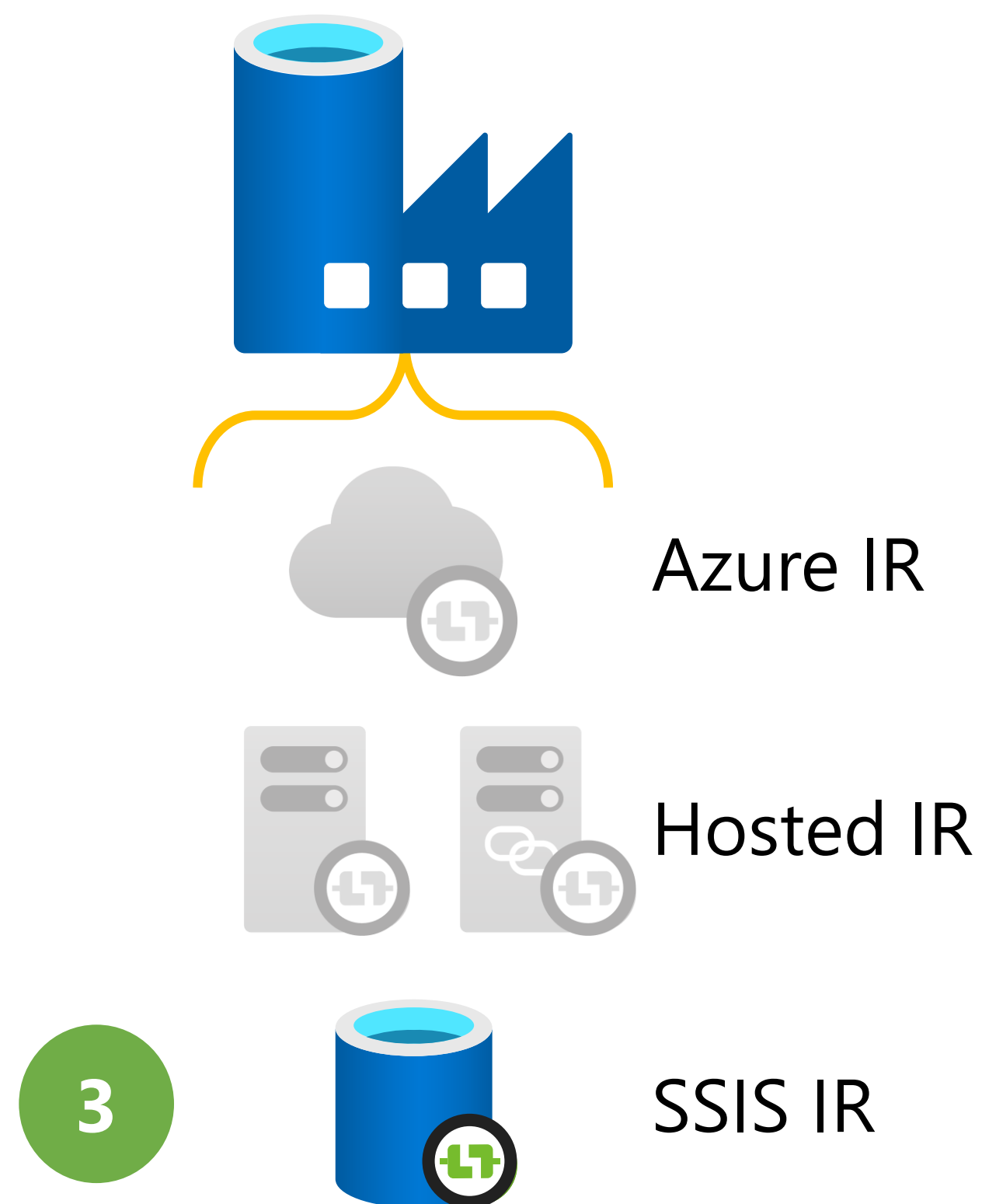
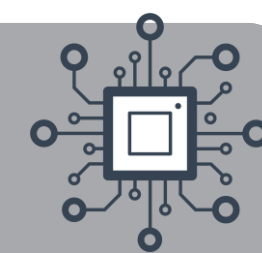
- Compute Types

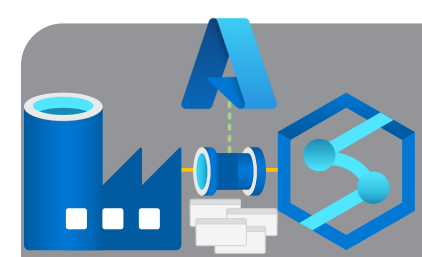
- Azure
- Hosted
- SSIS

- Patterns & Configuration

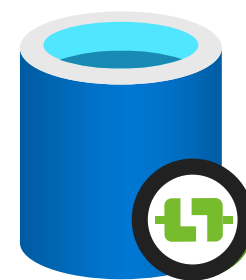
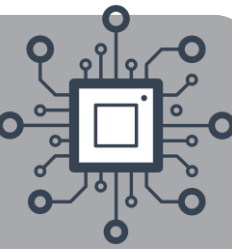


What can an Integration Runtime do?





Running an SSIS Package in Azure



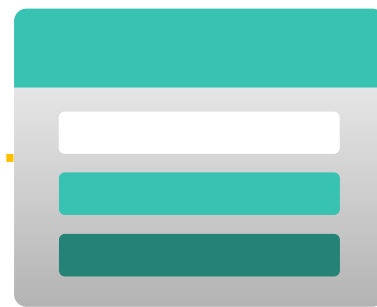
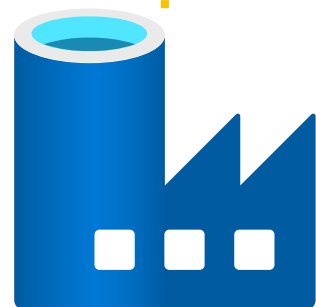
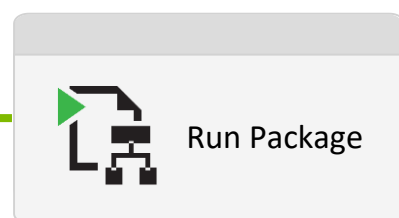
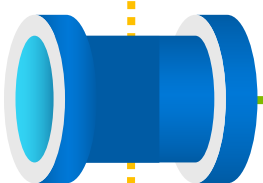
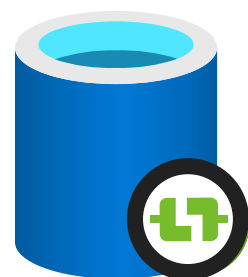
SSIS IR



Running an SSIS Package in Azure

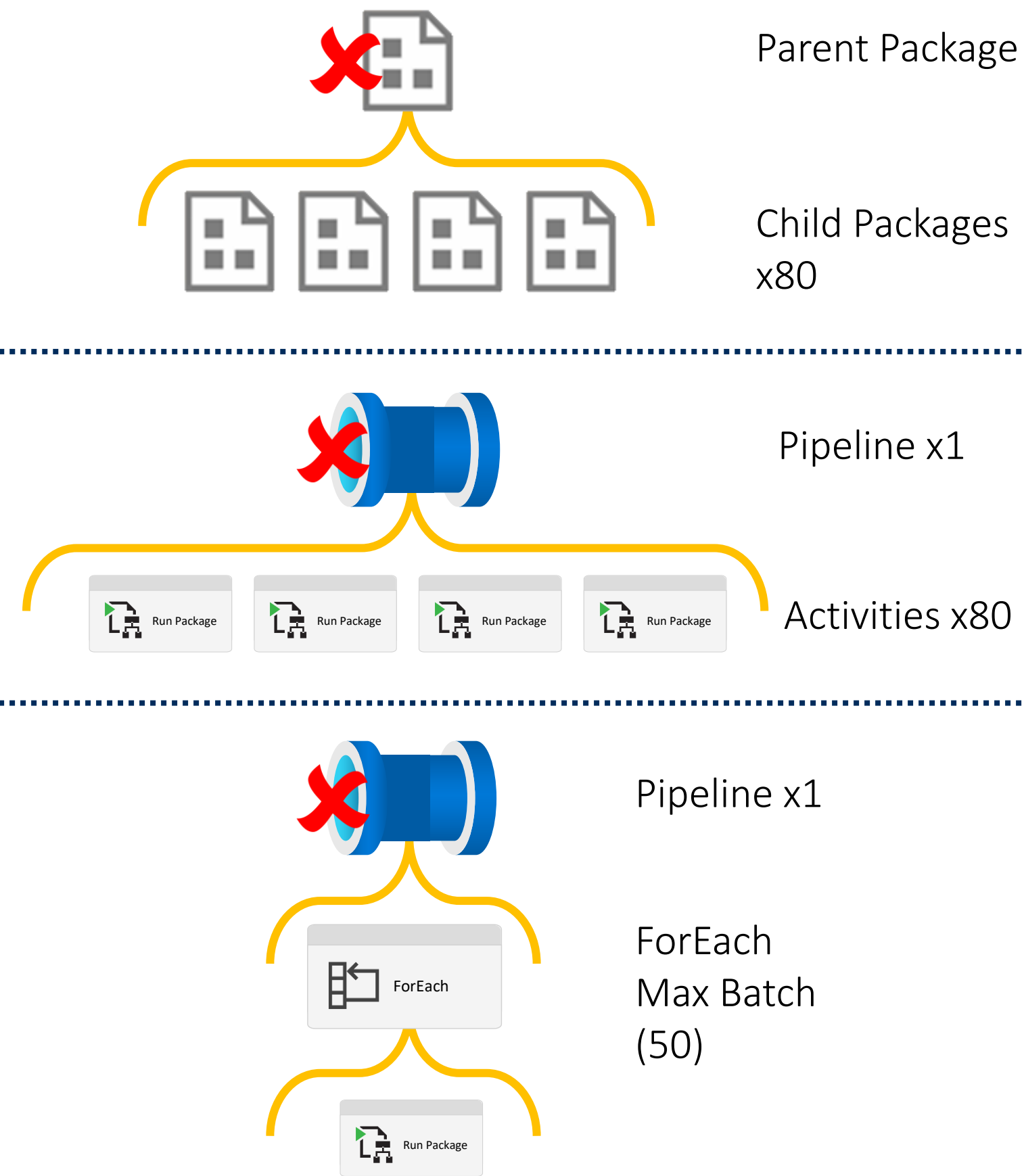
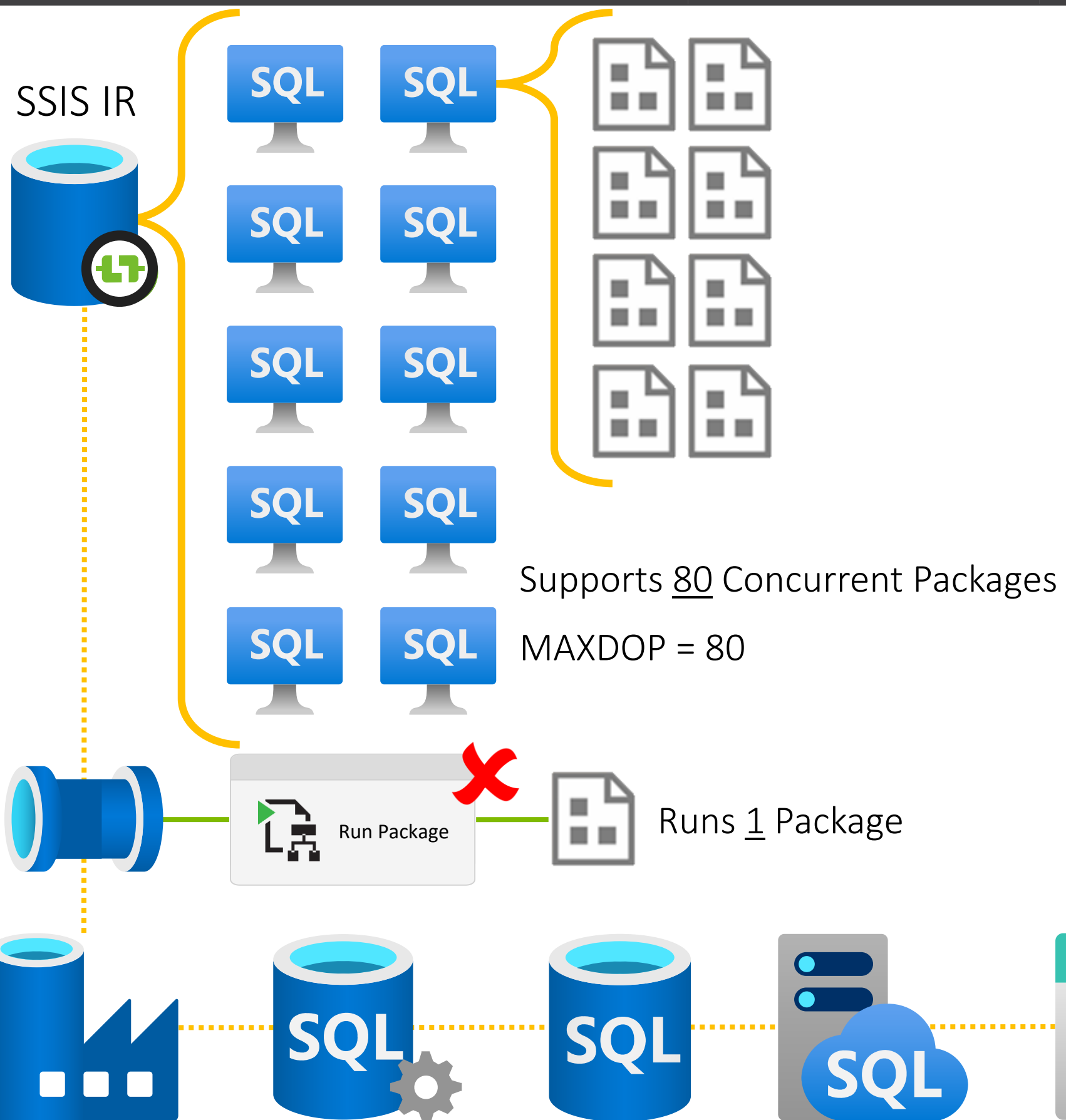


SSIS IR



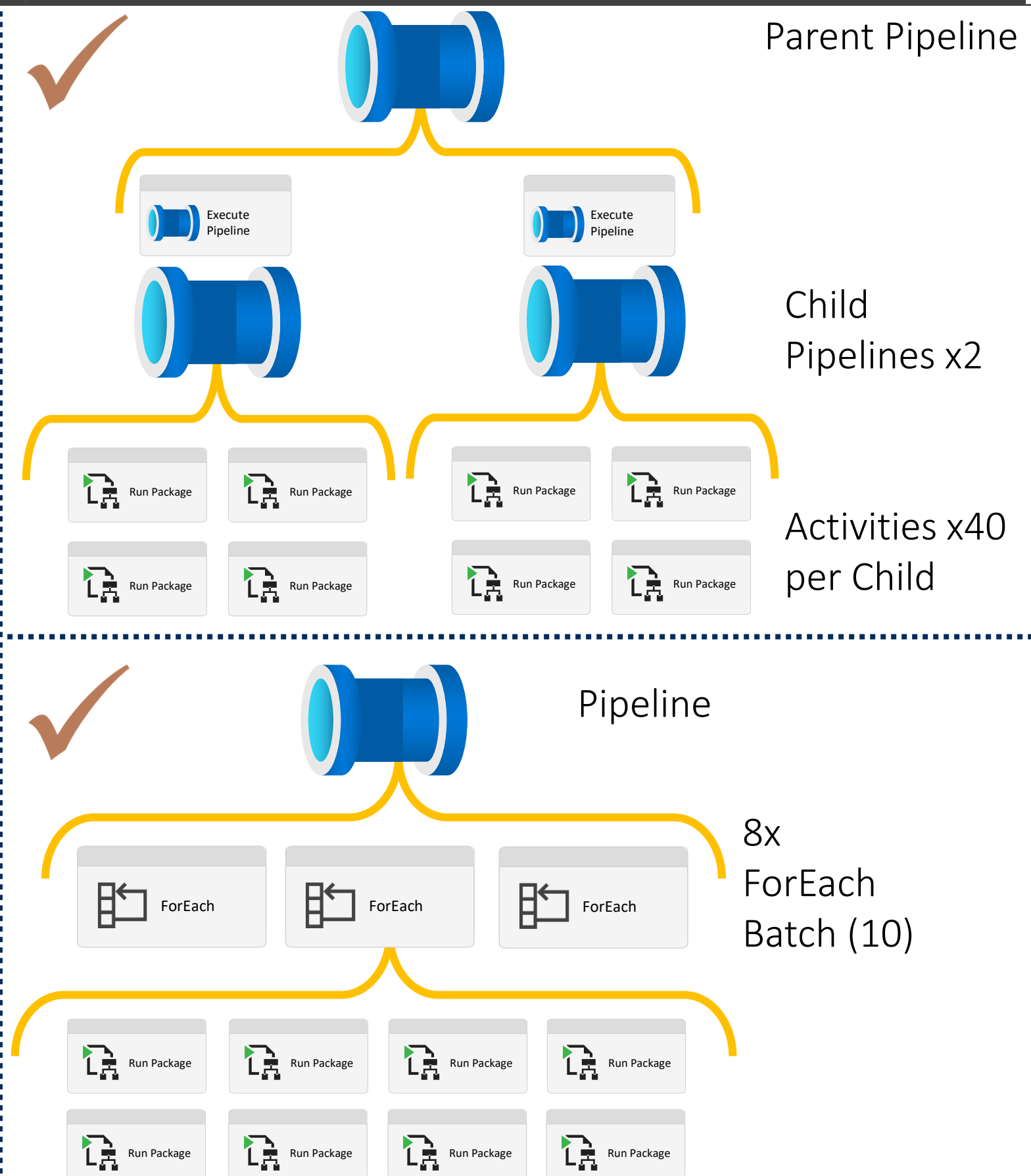
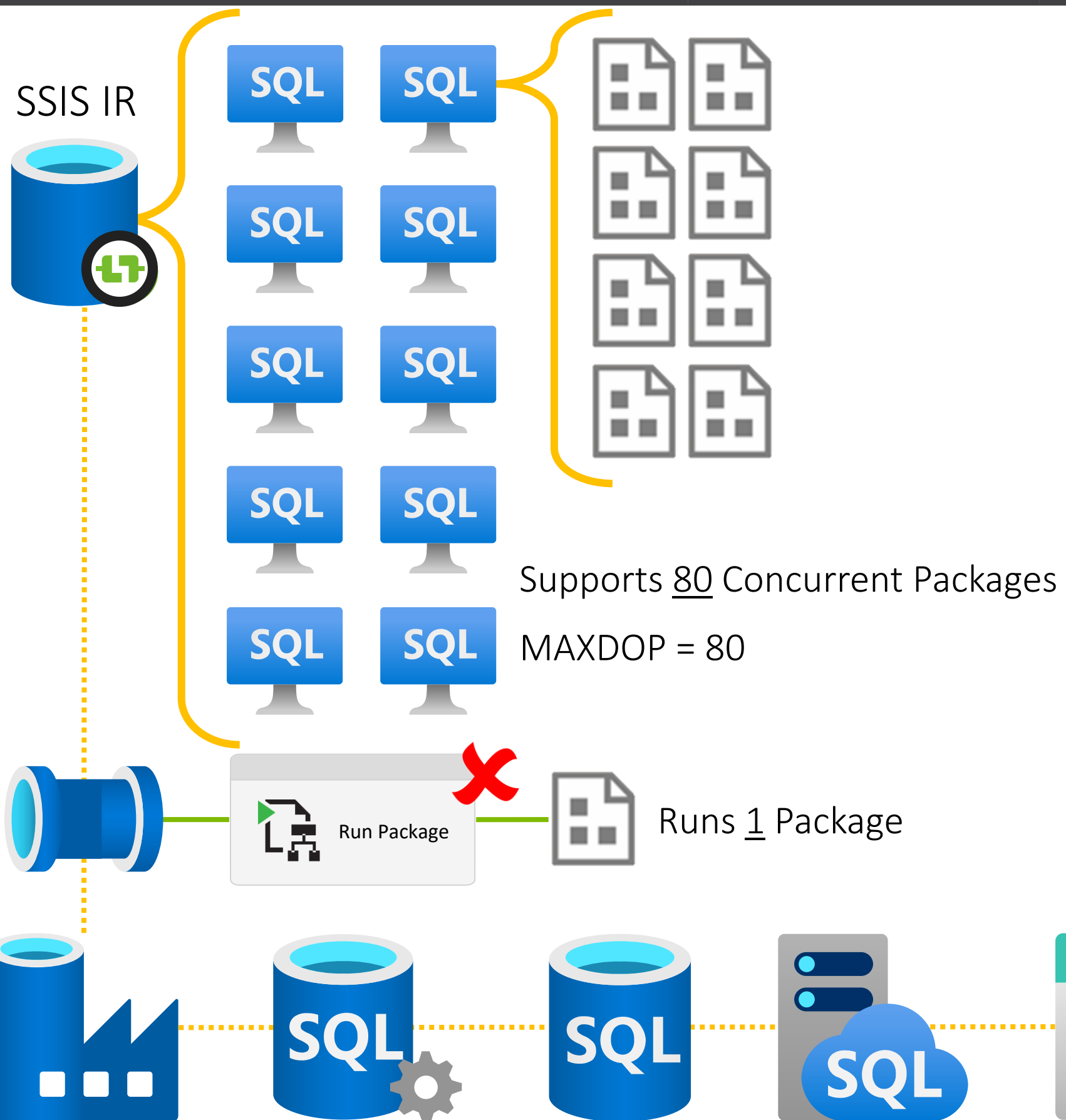


Problem: Using All Of The SSIS IR Compute





Solution 1 & 2: Static Pipelines

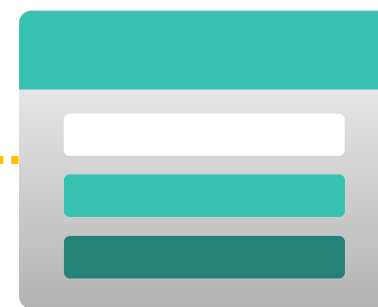
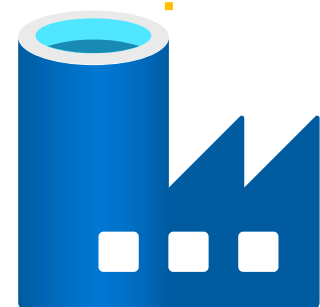
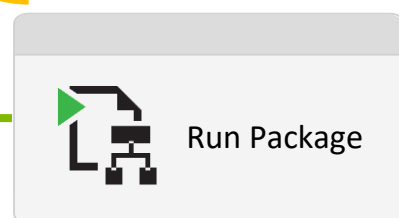
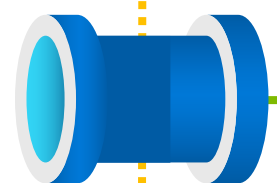
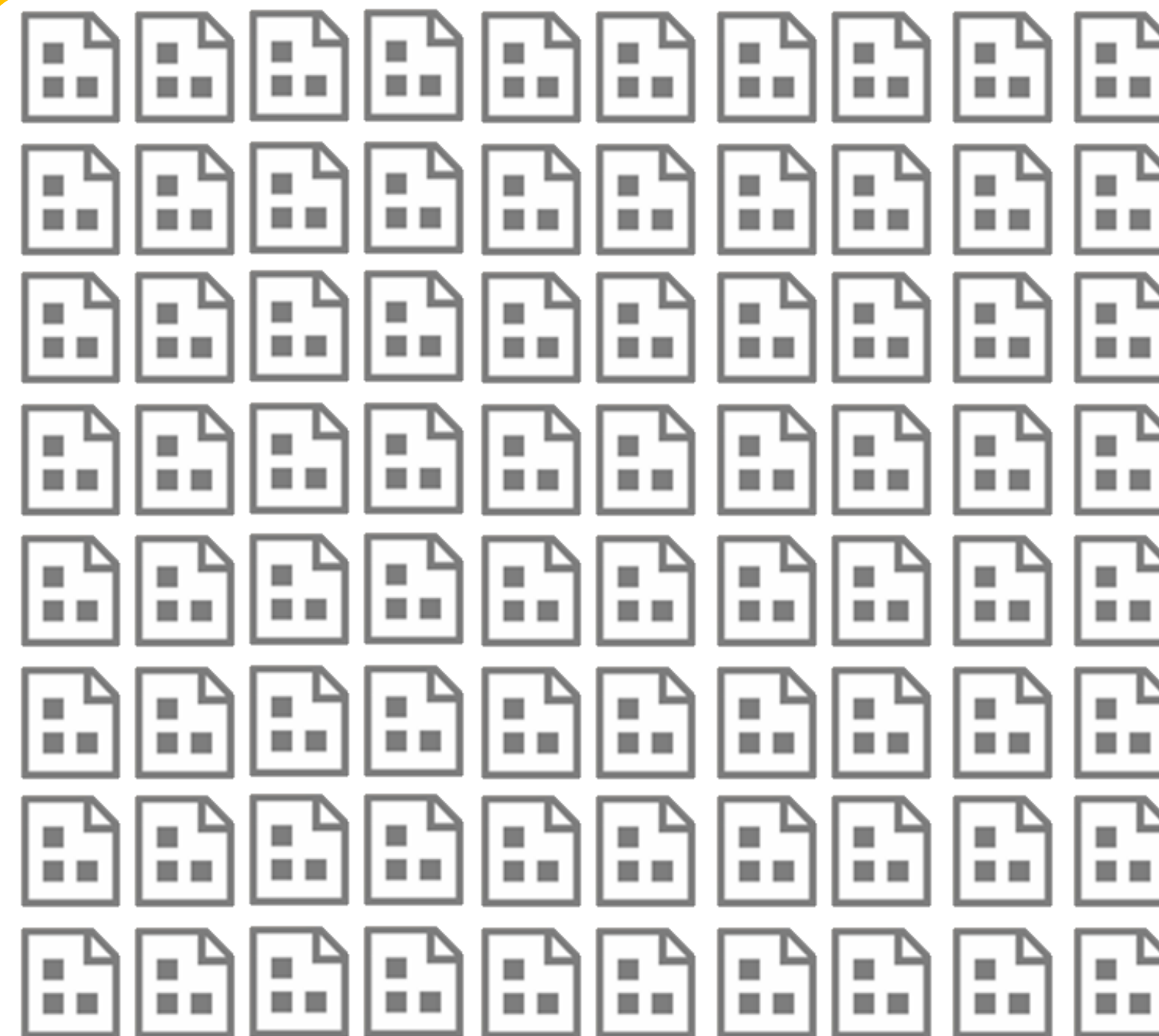
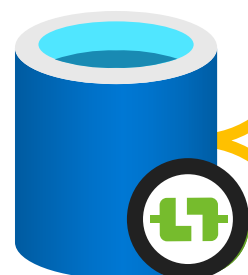




Solution 3: Packages Refactored on a Single Node IR

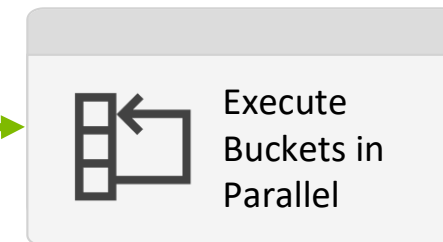
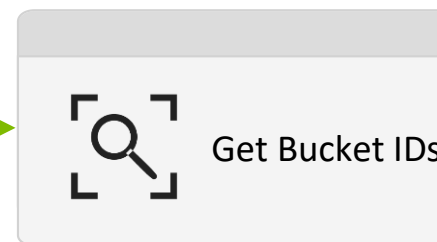
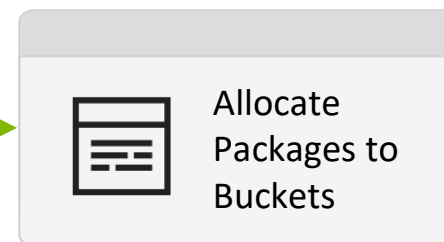
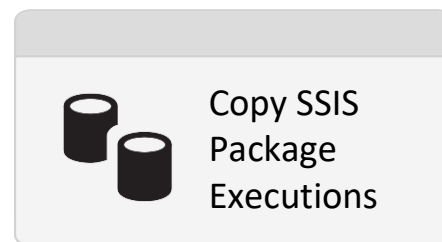
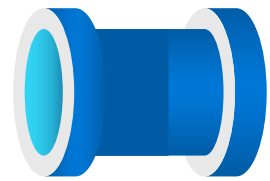
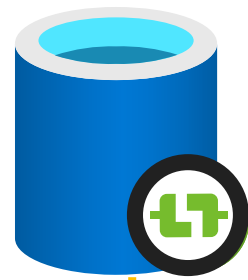


SSIS IR



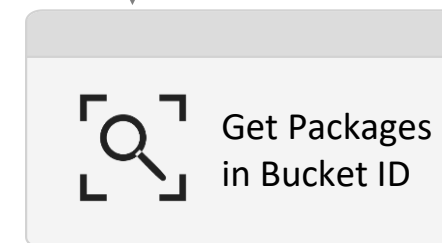
Solution 4: Nested ForEach Activities & Bucket Metadata

SSIS IR

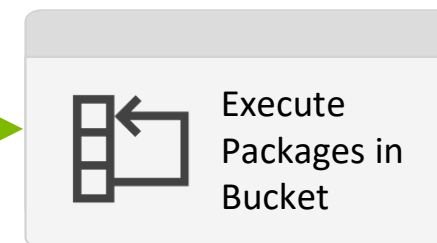


FE L1
MAXDOP 50

[Buckets]

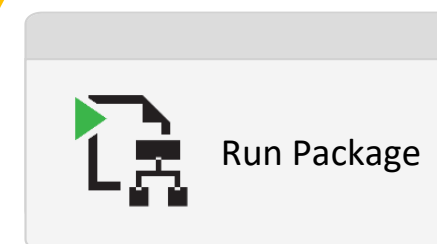


@item().BucketId



FE L2
MAXDOP 50

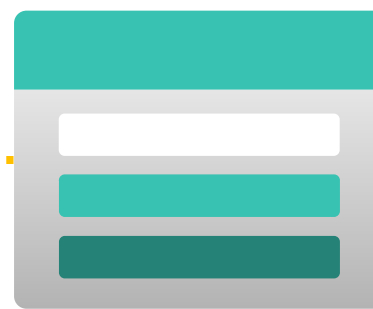
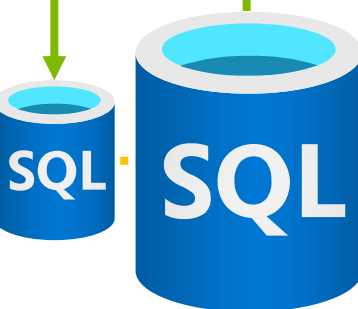
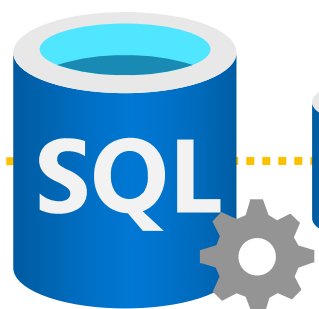
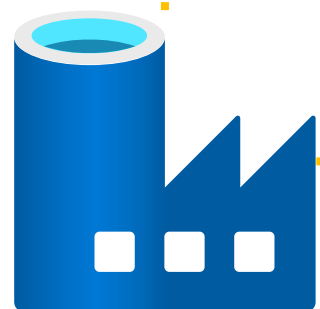
[BucketContents]



Compute size	S4	S6	S7	S9	S12
Max DTUs	200	400	800	1600	3000
Included storage (GB) ¹	250	250	250	250	250
Max storage (GB)	1024	1024	1024	1024	1024
Max in-memory OLTP storage (GB)	N/A	N/A	N/A	N/A	N/A
Max concurrent workers (requests)	400	800	1600	3200	6000
Max concurrent sessions	4800	9600	19200	30000	30000

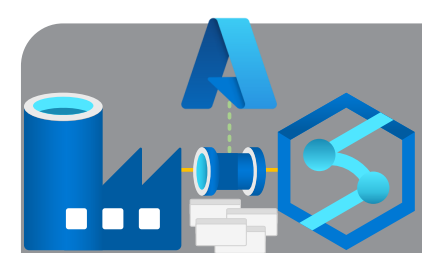
<https://docs.microsoft.com/en-us/azure/azure-sql/database/resource-limits-dtu-single-databases>

SSISDB

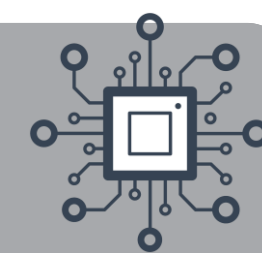


$$(FE L1) \times (FE L2) = NEW MAXDOP$$
$$50 \times 50 = 2500$$

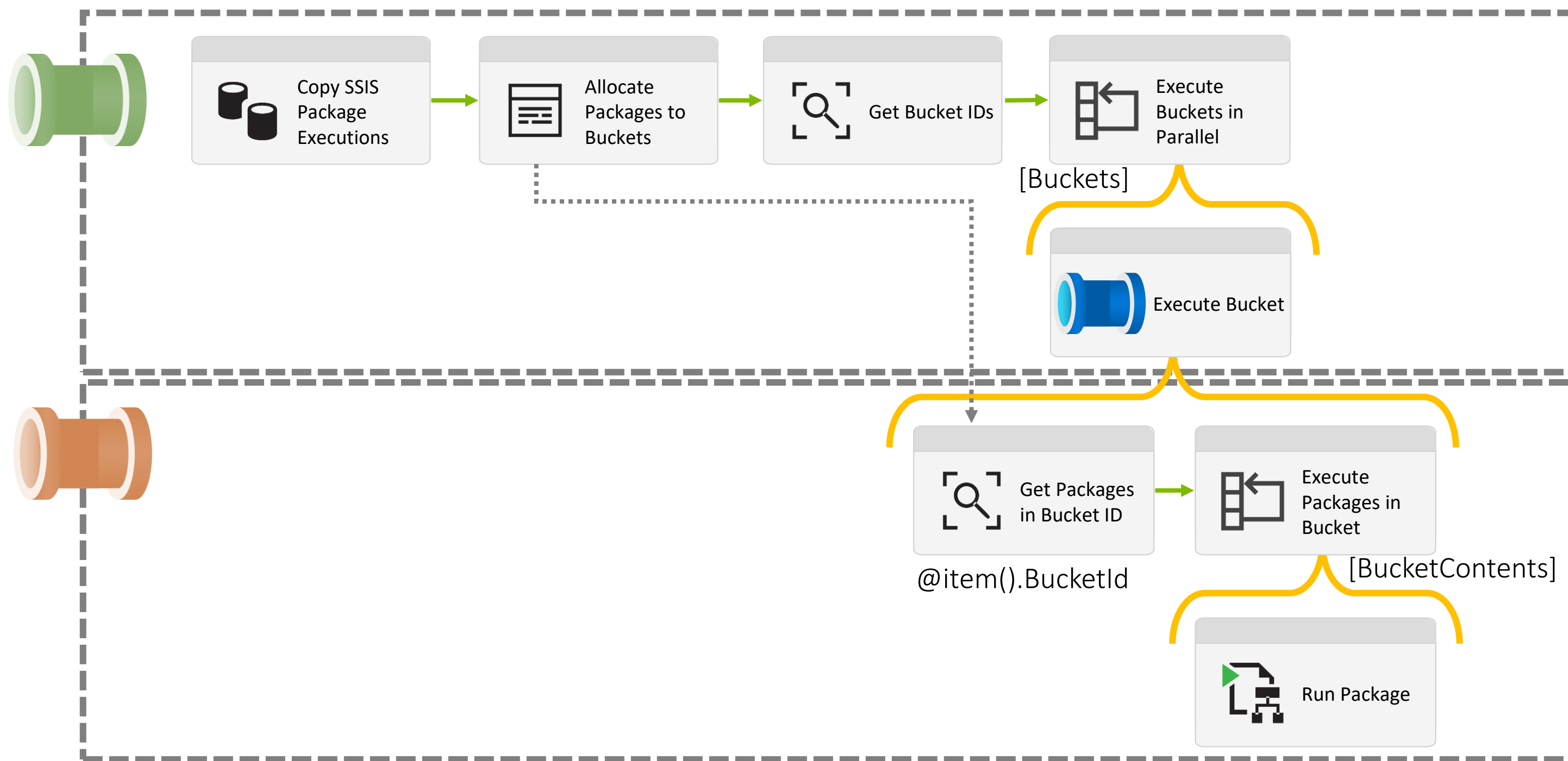
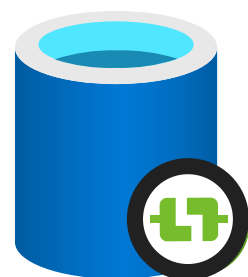




Solution 4: Nested ForEach Activities & Bucket Metadata

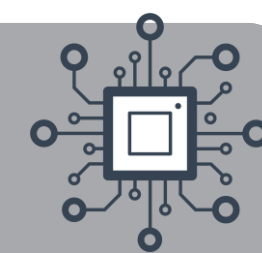


SSIS IR





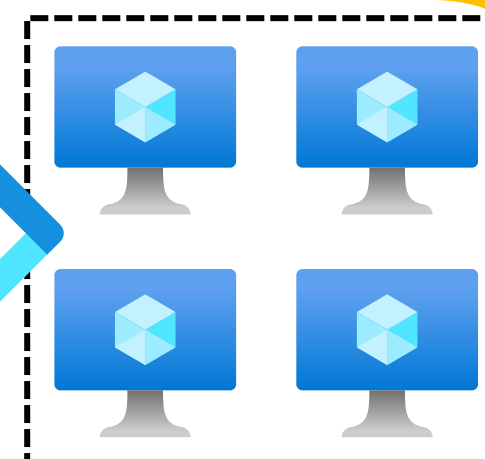
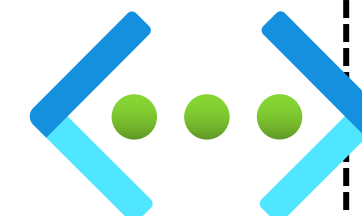
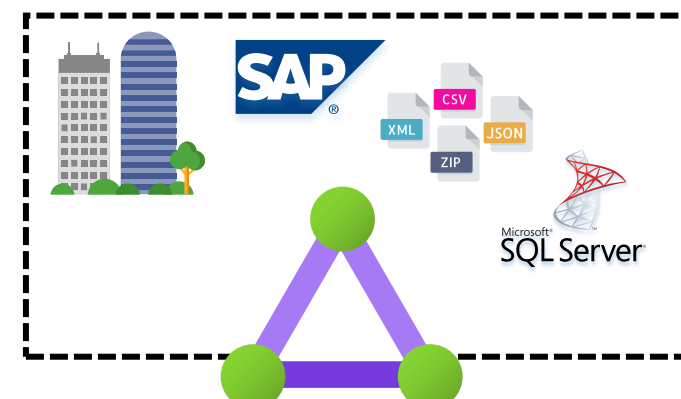
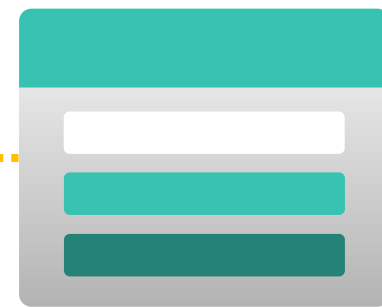
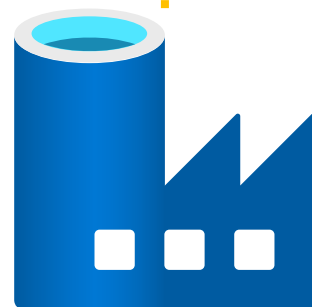
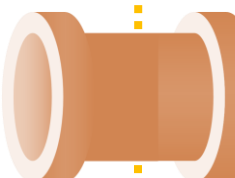
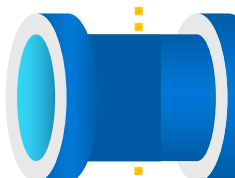
What are the advantages of using this pattern?



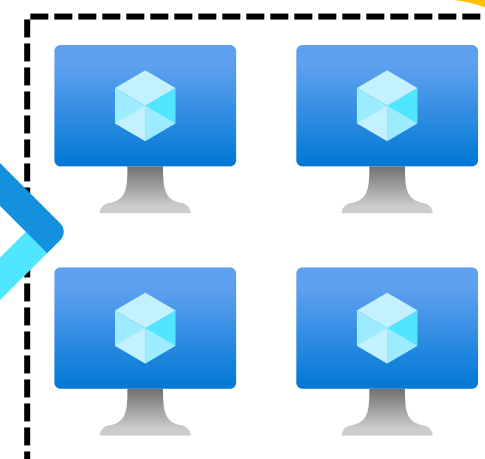
SSIS IR



10x Nodes
80x Packages

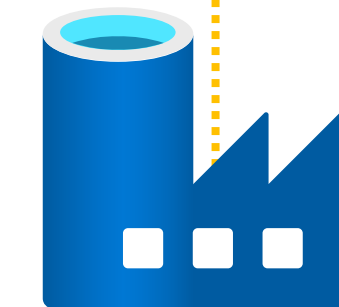
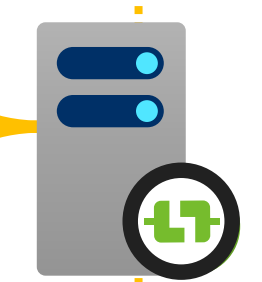
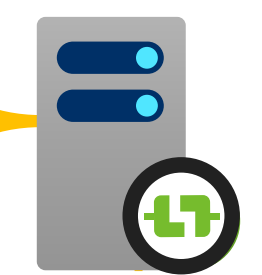


4x Nodes
?? Job Concurrency



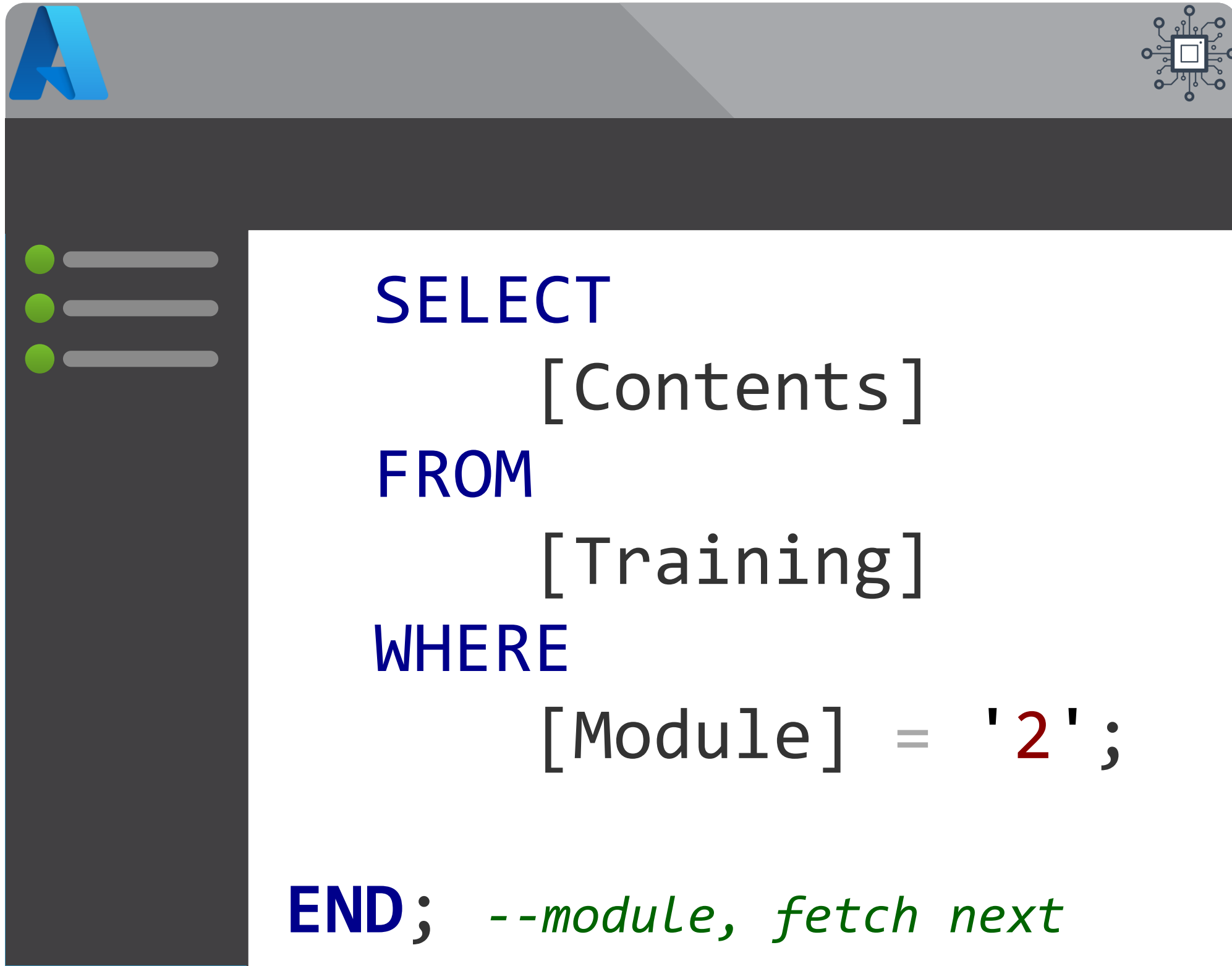
4x Nodes
?? Job Concurrency

Hosted IR



Module 2

Integration Runtime Design Patterns



- Compute Types
 - Azure
 - Hosted
 - SSIS
- Patterns & Configuration